U.S. DEPARTMENT OF THE INTERIOR

THIRD INTERIM PARTIAL CLAIM FOR ASSESSMENT AND RESTORATION PLANNING COSTS
20 APRIL 2010 *DEEPWATER HORIZON* (MC 252) INCIDENT

TIME PERIOD: JANUARY – DECEMBER 2014

Submitted By:

Cynthia K. Dohner
Regional Director, FWS Southeast Region
Authorized Official for the Department of the Interior
1875 Century Blvd.
Atlanta, GA 30345

October 3, 2014

Table of Contents

EXECUTIVE SUMMARY

On April 20, 2010, an explosion and fire on the *Deepwater Horizon* mobile offshore drilling unit resulted in 11 worker fatalities and discharges of oil and other substances from the rig and seabed wellhead into the Gulf of Mexico. Pursuant to section 1006 of the Oil Pollution Act ("OPA"), 33 U.S.C. §§ 2701 *et seq*, and Executive Order 13626, federal, state, and federally recognized tribes are Trustees for natural resources and are authorized to act on behalf of the public to: (1) assess natural resource injuries resulting from a discharge of oil or the substantial threat of a discharge and response activities; and (2) develop and implement a plan(s) for restoration of such injured resources.

This document identifies 14 assessment and restoration planning procedures, including studies, which agencies within the U.S. Department of the Interior ("Department" or "DOI") are implementing in 2014 to inform natural resource damage injury determination, injury quantification, and restoration selection activities associated with the *Deepwater Horizon* Oil Spill ("Oil Spill"). This document is a supplement to the Department's Interim, Partial Claim dated July 1, 2011, and the Second Interim Partial Claim, dated October 4, 2012, which identified Assessment procedures that may have been performed in 2011, 2012 and 2013. The collection of activities identified in this Third Interim Partial Claim ("Claim" or "Third Claim") reflect consideration of the factors identified in 15 C.F.R. § 990.27 (use of assessment procedures), § 990.51 (injury determination) and § 990.52 (injury quantification). The assessment activities also reflect consideration of data and analyses conducted during the pre-assessment phase of the Natural Resource Damage Assessment ("NRDA"). Restoration planning activities identified reflect consideration of the factors identified in 15 C.F.R. § 990.53 (developing restoration alternatives), § 990.54 (evaluation of alternatives), and § 990.55 (developing restoration plans). The Department will also be further developing and maintaining a document management system to support the Trustees' efforts to develop an Administrative Record. In addition, the Department will be evaluating injury assessment and restoration planning and implementation records for inclusion into the Administrative Record(s) (§ 990.61). Scientific information to support injury determination and quantification, although incomplete, is sufficient for the Trustees to proceed with restoration planning. The Department's assessment and restoration planning activities in this Claim are a subset of the NRDA activities conducted by all Trustees. Department activities in this Claim document focus on impacted natural resources the Department directly manages – including endangered species, migratory birds, and DOI-managed lands and facilities. The Department expressly reserves its ability to supplement the assessment and restoration planning procedures identified herein.

This Third Claim covers the Department's assessment and restoration planning activities and estimated costs for 2014 that are unique from activities already paid for by BP or the U.S. Coast Guard. The document is organized to provide a description of the Department's proposed activities by resource category or major topic area. The Department's Injury Assessment, Restoration Planning, and Case Management costs include labor costs of all the

staff employed by the Department that are required to prepare a comprehensive injury assessment and restoration plan. The Department requires a total of $17,916,082 to complete NRDA activities during the budgeted period.

Exhibit 1 provides summary cost information for estimated contractor costs for assessment and restoration planning procedures included in this Claim, including proposed field studies, laboratory and data analysis, and data management which totals $3,003,721. Exhibit 2 provides estimated costs for coordination, oversight, implementation and analysis activities for DOI personnel in 2014. Although different labor rates and total hours were estimated for a variety of DOI personnel, the total cost is used to cover expenses for approximately 142 administrative support specialists, scientists, restoration specialists, attorneys and program managers working on the NRDA. These costs total $12,575,481. In addition, as shown in Exhibit 3, the Department also seeks $2,336,880 in contingency funds, estimated at 15% of the sum of assessment and restoration planning costs. Contingency funds are intended to cover the risk that actual costs are higher than expected, and will only be made available upon documentation of higher than expected costs.

In total, the Department is seeking a sum certain of $14,461,803 for injury assessment and restoration planning activities specified in this document. This amount is less than that requested in DOI's original 2014 Claim, as some of the contractor support needed for these 2014 activities is being covered by advance funds previously provided by BP. In this revised 2014 Claim, DOI is still requesting funds to cover all of the oversight and coordination activities performed by DOI staff in 2014. DOI incurred approximately $5.8 million in expensed between January 1 and June 30, 2014. DOI has not received any advance funding or reimbursement from either BP or NPFC for these expenses. Additionally, DOI does not use or have available any appropriated funding to cover these activities and therefore has insufficient funding to cover the cost of the activities necessary for the essential assessment and restoration planning work that is currently being led by DOI staff. All DWH related expenditures are tracked using specific DWH codes which ensures clear accounting.

Data collection and analysis is ongoing, and may result in the identification of additional NRDA activities by the Department and/or its co-Trustees or, alternatively, the decision may be made to not pursue an activity identified in this Claim. The need for any additional studies and assessment activities and their relationship to existing data collection efforts and analyses and data management will be clearly identified in any future assessment claims. This Third Claim is not intended to, and does not, create any right or benefit, substantive or procedural, enforceable at law or in equity by any party against the United States, its departments, agencies, or entities, its officers, employees, or agents, or any other person.

Exhibit 1 – Injury Assessment Procedures Summary Budget – Contractor Support Costs

Activity	Contractor Support Costs	Contingency Amount
Endangered/Threatened Sea Turtles		
Telemetry Analysis for Nesting Kemp's Ridley and Loggerhead Sea Turtles (2013) and Sea Turtle Sample/Data Management	$1,036,161	$155,424
Birds		
Integration of Migratory Bird Exposure and Injury Assessment	-	-
DOI Managed Lands and Facilities		
2014 Addendum: Assessment of Jean Lafitte National Historic Park and Preserve (JELA) Submerged Aquatic Vegetation	-	-
2014 Addendum: Assessing Recovery of Submerged Aquatic Vegetation Propeller Scars at Gulf Islands National Seashore	-	-
Assessing Submerged Oil Mats by Remote Sensing Survey and Diver Characterization a Gulf Islands National Seashore-2013 (Year 2 in a 3 year study)	-	-
Other Assessment Activities		
Sand Beach Injury Assessment	-	-
Response Information – Data Management, Infrastructure, Administration, and Assessment	-	-
Injury Assessment, Management, and Administration		
Technical and Logistical Support for DOI's Deepwater Horizon Oil Spill NRDA (to include technical/logistical support, data verification/validation, QA/QC, peer review, REA, general case support)	$1,967,560	$295,134
Comprehensive Database for DOI-lead Studies, Analytical and Observation Data, Infrastructure and Administration	-	-
Comprehensive Document Management System for Assessment & Restoration Planning Records	-	-
Comprehensive Document Management System for the Administrative Record	-	-
Restoration Planning		
Restoration Planning	-	-
Total	**$3,003,721**	**$450,558**

Exhibit 2 – Costs for DOI Oversight, Coordination, Implementation, and Analysis

Name of Agency	TOTAL DOI Coordination, Oversight, Implementation, and Analysis
U.S. Fish and Wildlife Service	$8,340,481
National Park Service	$805,000
U.S. Geological Survey	$2,734,000
Bureau of Land Management	$1,000
DOI Solicitors	$695,000
Total	**$12,575,481**

Exhibit 3 – Contingency Funds and Total

	AC Cost	15% of AC Cost (Contingency)	Total AC
Assessment Procedure Costs	$3,003,721	$450,558	$3,454,279
DOI Personnel Costs	$12,575,481	$1,886,322	$14,461,803
Grand Total	**$15,579,202**	**$2,336,880**	**$17,916,082**

1. ADMINISTRATIVE INFORMATION

1.1. Claimant Eligibility and Coordination with Co-Trustees

The following governmental entities are designated natural resource Trustees under OPA and Executive Order 13626 and are currently acting as Trustees for this Incident[1]:

the U.S. Department of the Interior, as represented by the National Park Service ("NPS"), the Fish and Wildlife Service ("FWS"), and Bureau of Land Management ("BLM");

the National Oceanic and Atmospheric Administration ("NOAA"), on behalf of the United States Department of Commerce;

the Environmental Protection Agency ("EPA")

the US Department of Agriculture ("USDA")

[1] In this Claim, the *Deepwater Horizon*/MC 252 Oil Spill is referred to as "Oil Spill" or "Incident" which may include, as applicable, all Incident(s) related to the events of the explosion, fire and subsequent discharges of oil and other substances from the rig and wellhead on the seabed into the Gulf of Mexico.

the United States Department of Defense ("DOD");

the State of Florida's Department of Environmental Protection; and Florida Fish and Wildlife Conservation Commission;

the State of Alabama's Department of Conservation and Natural Resources and Geological Survey of Alabama;

the State of Mississippi's Department of Environmental Quality;

the State of Louisiana's Coastal Protection and Restoration Authority, Oil Spill Coordinator's Office, Department of Environmental Quality, Department of Wildlife and Fisheries and Department of Natural Resources;

the State of Texas' Parks and Wildlife Department, General Land Office, and Commission on Environmental Quality (collectively, the "Trustees").

In addition to acting as Trustees for this Incident under OPA, the States of Florida, Alabama, Mississippi, Louisiana, and Texas are also acting pursuant to their applicable state laws and authorities, including the Louisiana Oil Spill Prevention and Response Act of 1991, La. R.S. 30:2451 *et seq.*, and accompanying regulations, La. Admin. Code 43: 101 *et seq.*; the Texas Oil Spill Prevention and Response Acct, Tex. Nat. Res. Code, Chapter 40, Section 376.011 *et seq.*, Fla. Statutes, and Section 403.161, Fla. Statutes; the Mississippi Air and Water Pollution Control Law, Miss. Code Ann. §§ 49-17-1 through 19-17-43; and Alabama Code §§ 9-2-1 *et seq.*, and 9-4-1 *et seq.*

Several technical teams exist, each comprised of Trustee representatives and led by the Trustees to guide and coordinate data collection and analysis for the NRDA. As appropriate, these technical teams coordinate with and consider input from BP Exploration and Production, Inc. on technical team activities. The procedures identified in this Claim are planned to be implemented and/or overseen by DOI personnel, were developed in coordination with the Department's co-Trustees, and include technical team review.

Funds previously received by the Department from BP and/or NPFC have not been applied to any of the proposed activities in this Claim. Department expenses incurred as a result of proposed assessment work in deepwater communities, described in NOAA's Third Interim, Partial Claim for Assessment and Restoration Planning Costs (Dated July 11, 2013) are excluded from this Claim. Thus, Department expenses incurred in the following NOAA Claim categories are solely covered in NOAA's Third Interim Partial Claim:

- Deep Sea Soft Bottom Sediments
- Deep Sea Hard Ground Corals
- Mesophotic Reefs
- Benthic Megafauna

1.2. Responsible Party Information

The Responsible Parties ("RPs") identified for this Incident thus far are BP Exploration and Production, Inc. ("BP"); Transocean Holdings Inc. ("Transocean"); Triton Asset Leasing GmbH ("Triton"); Transocean Offshore Deepwater Drilling Inc. ("Transocean Offshore"); Transocean Deepwater Inc. ("Transocean Deepwater"); Anadarko Petroleum ("Anadarko"); Anadarko E&P Company LP ("Anadarko E&P"); and MOEX Offshore 2007 LLC ("MOEX"). Pursuant to 15 C.F.R. § 990.14(c), concurrent with the publication of the Notice to Conduct Restoration Planning, the Trustees invited the RPs identified above to participate in an NRDA. The Trustees have coordinated with BP, the only RP who accepted this invitation to actively participate in the NRDA process.

1.3. Determination of Jurisdiction

For reasons identified in the Notice of Intent to Conduct Restoration Planning for this Incident, the Trustees determined they have jurisdiction to pursue restoration under OPA. 75 Fed. Reg. 60800 (Oct. 1, 2010).

1.4. Time Limitations on Claims

This Claim for funding of reasonably necessary assessment and restoration planning procedures to inform Incident-specific injury determination and quantification analyses is presented in writing to the Director, National Pollution Funds Center (NPFC) within time limits specified in 33 C.F.R. § 136.1010 (i.e., within three years from the date of completion of the natural resources damages assessment). The NRDA for this Incident is not complete.

1.5. Legal Action

On December 15, 2010, the United States filed its complaint against the RPs in the Eastern District of Louisiana (Civil Case no. 2:10-cv-04536). At this time, the trial schedule does not include natural resource damages quantification in the first two phases of litigation.

1.6. Claim Presentation

This Third Interim, Partial Claim for Assessment and Restoration Planning Costs has been presented for a sum certain, in accordance with OPA to all of the identified RPs by letters dated October 8, 2013.

2. ASSESSMENT: OVERVIEW OF APPROACH

OPA regulations provide that NRDA procedures be tailored to the circumstances of the incident and the information needed to determine appropriate restoration. With respect to standards for assessment procedures, the regulations provide that (15 C.F.R. § 990.27(a)):

(1) the procedure(s) must be capable of providing assessment information of use in determining the type and scale of restoration appropriate for a particular injury;

(2) the additional cost of a more complex procedure must be reasonably related to the expected increase in the quantity and/or quality of relevant information provided by the more complex procedure; and

(3) the procedure must be reliable and valid for the particular incident.

OPA regulations identify several categories of assessment procedures available to Trustees, including but not limited to: procedures conducted in the field or laboratory; model-based procedures; and/or literature-based procedures (15 C.F.R. § 990.27(b)). If a range of assessment procedures providing the same type and quality of information is available, the most cost-effective procedure must be used (15 C.F.R. § 990.17(c)). Finally, assessment procedures must contribute to injury determination (i.e., by establishing the spatial and temporal magnitude of exposure to oil, the pathways of exposure, and/or the presence of injury, as described in 15 C.F.R. § 990.51) and/or injury quantification (i.e., quantifying the degree, spatial and temporal extent of injury to natural resources and the associated reduction in services caused by the injury, as described in 15 C.F.R. § 990.52).

The goal of the Department's assessment is to determine how natural resources over which the Department exercises jurisdiction may have been impacted by the Oil Spill. Therefore, many of the Department's assessment activities focus on specific resources, such as DOI's national parks and wildlife refuges, migratory birds and nesting sea turtles. However, these individual resources are an integral part of the larger Gulf of Mexico ecosystem. Thus, the Department's assessment activities also relate the resource-specific effects to a more holistic view of the effects of the discharged oil to the Gulf of Mexico ecosystem. The Department continues to provide leadership in certain areas of the assessment, such as Birds (2014 IPC Activity #3); Sand Beaches (2014 IPC Activity #7) and Response Information (2014 IPC Activity #8). As of September 30, 2014, the Department completed or is participating in injury assessment activities conducted under more than 60 plans and plan addenda.

Many ongoing and proposed activities in 2014 involve the analysis of field data needed to inform estimates of the magnitude of injury and associated reduction in services, including monitoring for possible recovery of impacted resources. Models and literature-based methods also are used in selected investigations. The scale and cost of each proposed activity was carefully considered with co-Trustees, and represents a balance between the need for cost-effective assessment efforts and the geographic scale and complexity of this Oil Spill.

The Department determined the assessment procedures identified in this document meet the requirements set forth in the OPA regulations, and are integrated with (and not duplicative of) other NRDA data collection and analysis activities. In addition to coordinating with co-Trustees, the Department has coordinated these assessment procedures and the content of this Claim with NOAA's 2014 Claim (*NOAA Third Interim, Partial Claim for Assessment and*

Restoration Planning Costs July 11, 2013) to further ensure consistency and the complementary nature of the assessment and restoration planning activities. Modifications to the identified assessment procedures may be made because of the participation of BP in the NRDA pursuant to 15 C.F.R. § 990.14. A description of each assessment activity's purpose and related implementation information is provided in subsequent sections of this document, and in many cases, in the related work plans.

The Department regularly posts final NRDA work plans on the Internet. For the official record of Trustee NRDA investigations, visit the *Deepwater Horizon* Oil Spill NRDA Administrative Record. As of September 23, 2014, the site contains links to 130 NRDA work plans. Many of these work plans provide detailed technical methods and implementation information, and are incorporated by reference into this Claim.

NRDA work plans and study-related data
http://www.gulfspillrestoration.noaa.gov/oil-spill/gulf-spill-data/

NRDA Administrative Record
http://www.doi.gov/deepwaterhoizon/adminrecord/index.cfm

As described in NOAA's 2014 Interim Partial Claim, almost all of the earlier assessment work plans were focused intentionally on the data collection phase after the Oil Spill. However, more recent assessment plans for Department-led assessment activities address Trustee activities focused on data compilation, synthesis, analysis, interpretation, reporting, and restoration planning. Many of the Department's activities in this Claim are focused on the analysis and interpretation of scientific data necessary to quantify injuries from the Oil Spill, complete NRDA analyses, and plan for restoration. Some data collection including field work is still proposed as a continuation of assessment of potential injuries identified in the first days of the Oil Spill or to reduce uncertainties in the injury determination, including possible monitoring of recovery of impacted resources.

2.1. Overview of How DOI Estimated Assessment Costs for Each Activity

The Department is planning to complete many NRDA assessment activities by the end of 2014. To this end, the 2014 Claim is largely based on the amount of technical effort required to develop the Department's interpretation of injuries to natural resources and services from the Incident and to conduct region-wide restoration planning with the co-Trustees. Data management, scientific documentation, and legal review of analyses and technical deliverables are included as part of this Claim. Also included in the cost estimates is the level of effort expected for the anticipated amount of co-Trustee and RP coordination, laboratory and other data analysis schedules, and the number of anticipated work products, including finalization of large environmental and chemical datasets. Some of the proposed assessment activities are extensions of analysis and interpretation efforts prior to 2014, which, for a variety of factors, such as the seasonality of the data collection efforts,

laboratory space limitations, and Trustee review of data and interpretive reports, have not yet been completed.

As detailed in the following sections of this Claim, DOI is presently requesting support in this IPC for contractor costs for the following activities which have previously been submitted to NPFC for adjudication:

- Telemetry Analysis for Nesting Kemp's Ridley and Loggerhead Sea Turtles (2013) and Sea Turtle Sample/ Data Management; and
- Technical and Logistical Support for DOI's *Deepwater Horizon* Oil Spill NRDA.

The structure of the revised 2014 Claim follows that of DOI's original submission. DOI staff efforts related to particular injury assessment and restoration activities are identified and described in this Claim under the specific sections below. However, all Department personnel and travel costs associated with these efforts are accounted for under Activity #14, as in DOI's original submission. Activity #14 also includes Department staff efforts which are not identified and described under specific sections below: Gulf Sturgeon, Beach Mouse, and Aerial Imagery. Finally, DOI's Incident-wide case management and administration costs are included under Activity #14. These management and administration tasks include participation and leadership in Executive Council and Trustee Council subcommittees, budget and financial work, public affairs and communications, administrative support functions, and other overall case management. **Attachment A** lists the DOI personnel involved in the case, by resource category.[2]

A description of each activity is provided in subsequent sections of this Claim. Pursuant to current Department practice in this case, a work plan describing the activity in more detail was presented to BP and the National Pollution Funds Center ("NPFC") separately, where appropriate (i.e., salary and restoration planning activities will not have a separate detailed work plan).

As more information about the impacts of the Oil Spill becomes available, the Department expressly reserves its right to supplement the assessment procedures identified herein through additional claims for assessment and restoration planning costs. Modifications to the identified assessment procedures may be made as a result of the participation of BP in the NRDA pursuant to 15 C.F.R. § 990.14.

The Department transmitted a work plan to BP along with an "Invoice/Request for Advance Funding." This transmittal satisfied presentment as required under the NPFC regulations. This IPC represents the Department's request for adjudication of elements of the Claim for which the Responsible Party has declined to pay.

[2] Attachment A reflects the DOI personnel involved in the case, by resource category, at the time this Claim was submitted to the NPFC. Staffing assignments may change thereafter.

3. Endangered/Threatened Sea Turtles

The Department's assessment activities focus on nesting sea turtles whereas the assessment activities of our co-trustee, NOAA, focus on oceanic and neritic turtles. Under this activity, the Department will continue to integrate and summarize data and findings from ongoing efforts to document exposure and injury to sea turtles from the *Deepwater Horizon* Oil Spill. Data and analysis from the nesting sea turtle studies will be incorporated into the Sea Turtle Exposure and Injury Assessment Report, as described in NOAA's Third Interim Partial Claim. The end product of this integration effort will be the production of a Trustee sea turtle interpretive report which will summarize data and findings for sea turtles impacted by the *Deepwater Horizon* Oil Spill.

Over the past four years, the Department has undertaken many exposure and injury assessments of nesting sea turtles and nests, some of which are ongoing. For example, loggerhead nest counts at index beaches on the Florida panhandle have been statistically compared against nest counts at reference beaches using a before-after-control-impact statistical model; this model found evidence for reduced nest counts in 2010. Furthermore, the Department has identified spatial and temporal overlaps between the 2010 Panhandle loggerhead nesting and both shoreline oiling and response activities; these overlaps are generally consistent with a potential for reduced loggerhead nesting in the Panhandle region. Additionally, the Department has relied upon the results of the response effort to translocate sea turtle nests from the Gulf of Mexico sites in Alabama and Florida to the Atlantic coast of Florida to determine how many turtles, including hatchlings, were injured as a result of the Spill. Finalization of the nesting/oiling and nesting/response overlap analyses, and documenting the results, are among the tasks remaining in 2014 and beyond.

Over the past four years, work undertaken under the Loggerhead sea turtle nesting plan has generated information on the number of females that nest on Alabama beaches and information on whether these females also use nesting sites elsewhere in the Gulf. These data are relevant not only in helping identify the extent of possible injuries but also will allow for better identification and/or review of restoration options specific to this subpopulation.

The Department has also been evaluating Kemp's ridley sea turtle nesting count data from Texas and Mexico. Data are presently available through 2013; preliminary 2014 counts are available, with final figures expected later this year. Nesting trends in Texas appear to closely match nesting trends in the much larger Mexican group. Post-2009, nest counts at both locations have been dramatically below those that had been projected prior to the spill. The Department continues to evaluate approaches for examining these concerning results in more detail. Possible approaches to quantify differences between the expected and actual nesting rates include empirical statistical modeling (e.g., based on pre- and post-spill evaluation of variance) and/or a more mechanistic population modeling approach. Some modeling approaches may allow the Department to examine possible mechanisms for the reduced nesting (e.g. acute vs. chronic stressors). More work is needed, both to identify and quantify the extent of the reduced nesting, and also to explore potential causes. This work is

essential, as the potential exists for ongoing, population-wide injury to this critically endangered species.

In the past four years, the Department has also undertaken extensive evaluations of other biologically important endpoints, such as Kemp's ridley clutch size/hatching success/emergence success (2008-2013), embryonic deformities (2008-2013), and sex ratios (2010-2012). The Department has also initiated genetic analysis of Kemp's ridley nesting females and nests (2010-2012), to facilitate linking nests to specific known and unknown females. Blood samples from nesting females have been collected (Kemp's ridley in 2011 and 2012; loggerheads in 2012) and these have been subject to clinical chemistry and hematological analysis. For most of these efforts, data generation (including sample analysis) is complete or nearing completion; however, other tasks such as data validation/verification, and documentation of the studies' methods and results, and interpretation, are not yet complete.

The Department has been exploring the potential exposure of nesting females and nests to *Deepwater Horizon* oil using multiple approaches. Physical samples (tissues, nest materials, carapace wipes) have been collected for contaminant analysis and/or for cytochrome P450 studies. Many samples have been analyzed; analysis for the remaining samples is ongoing (except for those samples that the Department has chosen to archive). In addition, as part of the nesting sea turtle work plans, nesting loggerhead and Kemp's ridley females were equipped with satellite transmitters to identify their foraging and inter-nesting behaviors. This effort is yielding important information about the nature and timing of habitat use, and the principal investigators have published several papers with components of these findings. Telemetry research to date has also demonstrated significant overlap between habitats used by these animals, and the locations of surface oiling from the *Deepwater Horizon* Oil Spill. The Department is working closely with NOAA on this exposure analysis, as NOAA continues to refine its oil-on-water data product.

Later this year and in 2015, the principal investigators will use the telemetry data to explore the extent to which foraging and/or inter-nesting behavior may have changed after the spill: preliminary analyses suggest that some such behavioral changes may be detectable. The Department has also examined foraging patterns using stable isotope analysis of nesting female carapace samples. Stable isotope analysis can provide information both about the trophic level at which these are feeding, and about general geographic locations. Samples were collected from adult nesting females of two species (Kemp's ridley in 2010-2012, and loggerheads in 2012). Analytic results to date suggest a change in Kemp's ridley foraging locations for 2011 and 2012 relative to 2010; however, full analysis and interpretation of these results and development of associated documentation, are still underway.

To explore issues of causality and mechanism at the cellular level, the Department has been pursuing loggerhead tissue culture studies. Loggerhead fibroblasts have been established, and a number of cellular assays have been optimized. Laboratory experiments with a variety of compounds including individual PAHs are currently complete or nearing completion, although documentation of the studies' results is ongoing. Similarly, sea turtle skin

organotypic cultures have been established, and these will be used to evaluate whether changes in CYP1A5 expression can be detected in response to contaminant exposure. To date, organotypic assays for viability have been optimized, as has a gene expression assay; optimization for the protein expression assay is underway.

In 2014 and beyond, the Department will also be an active participant in the Life History Tables Working Group described in NOAA's Third Interim Partial Claim. This activity also includes the Department's 2014 activities related to endangered/threatened sea turtles assessment data management activities, such as additional quality assurance/quality control (QA/QC) activities, including data verification and validation, in coordination with co-Trustees and with BP, as appropriate.

An additional assessment activity for which the Department requests funds is support to integrate findings of the nesting sea turtle exposure and injury assessment reports activity with the ongoing efforts by NOAA to document exposure and injury to oceanic and neritic sea turtles. These funds are in addition to those identified in NOAA's Third Interim Partial Claim as it is anticipated that multiple people with complementary skill sets may be required to develop the integrated report. The funds identified for this activity will be expended by the Department in coordination with, and not duplicative of, expenditures by NOAA.

3.1. 2014 IPC # 1: Telemetry Analysis for Nesting Kemp's Ridley and Loggerhead Sea Turtles (2013) and Sea Turtle Sample/Data Management

3.2. 2014 IPC # 2: Integration of Sea Turtle Exposure and Injury Assessment

Purpose of Activity and Injury Assessment Need

To develop an overall injury assessment strategy for Kemp's ridley and Loggerhead sea turtles, Department staff engaged in an intense collaborative effort that included both regional and national experts as well as coordination with co-Trustee technical staff. Department staff are leading the injury assessment for nesting Kemp's ridley and Loggerhead sea turtles, including an assessment of lost nests. No other trustee is conducting assessment activities on nesting and hatchling sea turtles. The Department has conducted several assessment activities to evaluate exposure and injuries to Kemp's ridley and Loggerhead sea turtles and their nests, which have either been funded by the NPFC or through cooperative assessment activities with BP. The Department has examined nesting female Kemp's ridley and Loggerhead sea turtles in the field for evidence of illness or tumors, and collected carapace swabs, tissue samples, blood samples, and scute samples for analysis in the Turtle Analytical Plans. The Turtle Analytical Plans includes chemical, biochemical and toxicological analyses to measure and determine exposure and effects of *Deepwater Horizon* oil in the sea turtles. Additionally, the Department tagged the sea turtles with satellite transmitters to evaluate nesting sea turtles' exposure to oil. The Department also evaluated Kemp's ridley and Loggerhead sea turtle nesting emergence and success

through coastal surveys following nesting, as well as an evaluation of nesting emergence and success for any remaining eggs that did not hatch through incubation and protected corralling. Data collection and analytical work that the Department has conducted will assist the Department in evaluating Kemp's ridley and Loggerhead sea turtle exposure to *Deepwater Horizon* oil and assessing resulting injuries.

As part of the Department's injury assessment for nesting Kemp's ridley and Loggerhead sea turtles and their nests, Department staff devotes significant time to leading and coordinating work under the Turtle Analytical Plans. The Department's work under the Turtle Analytical Plans includes analytical chemistry work, completion of analysis, quality assurance/quality control, and end of study reports for bile, chorioallantoic membranes, blood, and eggs from Kemp's ridley and Loggerhead sea turtles collected in 2010 and 2011. Departmental staff also leads and coordinates the continued evaluation of analytical results and end of study reports as the principal investigator for Kemp's ridley and Loggerhead sea turtle telemetry data. Department staff facilitates co-Trustee coordination calls and meetings to evaluate the data generated through these activities, and will continue to facilitate co-Trustee coordination on the production of a trustee sea turtle interpretive report which will summarize data and findings for sea turtles impacted by the *Deepwater Horizon* Oil Spill.

In 2014 DOI will work on the integration of the 2013 satellite telemetry information into the state space model being developed as part of the ongoing NRDA. The analysis and integration will include satellite data from the Kemp's Ridley and Loggerhead sea turtles that were tagged as part of the cooperative 2013 field nesting season, as well as the integration of any new satellite data from satellite tags previously affixed during the 2010-2012 field nesting seasons. The Sea Turtle data and sample managers will be involved in the overall data quality assurance/quality control activities, including, as appropriate, data verification and validation efforts, and the coordination of long term storage for the samples collected as part of the nesting sea turtle assessment activities.

The data analysis and the proposed statistical analysis for DOI's sea turtle assessment will be conducted in accordance with the scientific method and accepted area of practice protocols previously established within the sea turtle and mathematics communities.

Relationship to Other Activities and Data

Data analyzed will be directly comparable with historic data and NRDA data (2010-2013). No other trustee is conducting assessment activities on nesting and hatchling sea turtles. The principal investigators for the nesting sea turtle assessment studies have data and sample managers who are separate from the contractor support that the Department has engaged for the overall data quality assurance/quality control activities (see 2014 IPC Activity #9).

Coordination and Implementation

Departmental Sea Turtle assessment work implemented as part of this NRDA will be coordinated with co-Trustees and integrated into the Sea Turtle Exposure and Injury Assessment Report described in NOAA's Third Interim Partial Claim.

Administrative Record

The DOI team will continue to respond to requests for documents to complete the administrative record. This activity will include providing new documents and data related to fieldwork and/or analyses. The costs of the DOI team in gathering and providing these records for Administrative Record purposes is captured here; the costs of capturing and processing these records for Administrative Record purposes is captured under the Administrative Record Tasks, IPC #12.

Principal Investigators

DOI staff efforts related to this activity are identified and described in this section, but the associated DOI personnel and travel costs are accounted for under Activity #14, DOI Injury Assessment, Restoration Planning, and Case Management. The senior DOI staff involved in overseeing and coordinating the sea turtles injury assessment are Mike Hooper, Christopher Schmitt, Kristen Hart, James Haas, Donna Shaver, Charles Wood, and John Rudolph. Other DOI staff involved in this effort are David Alvarez, Robert Gale, Stephanie Perkins, Mike Tanner, Kevin Feltz, Jesse Arms, Margaret Lamont, Rosalie Rossi, Cynthia Rubio, Jennifer Walker, and Thomas Shearer. DOI is also requesting funds for contractor support for this activity in 2014. Key contractors involved in this effort include Texas Tech University, University of Florida, CERC Five Rivers, and Cherokee Nations, as well as Alix VanGeel at IEc.

RP Involvement

The Department as the lead for the assessment of nesting sea turtles along with NOAA and our co-Trustees have worked cooperatively with BP throughout the exposure assessment phases. Weekly coordination calls were conducted through the sea turtle technical team. The TAP and its subsequent addendums, as well as, the Kemps ridley and Loggerhead sea turtle nesting plans were conducted under cooperative work plans developed with BP. Data results from cooperatively funded plans have been shared with BP. However the interpretation of data which began in 2012 and the production of the Trustee-internal interpretive reports will be conducted independently of BP.

Timeframe

These activities will be ongoing throughout 2014.

4. BIRDS

MC 252 oil came to be located in many areas of the northern Gulf of Mexico in Texas, Louisiana, Mississippi, Alabama, and Florida including in open water, bays, saltwater and brackish marshes, sand beaches, barrier islands, tidal mud flats, and mangrove stands. All these areas provide habitat for various species of birds that were impacted by the spill.

A very diverse assemblage of bird species spend all or a portion of their lives in the Gulf of Mexico and along its shorelines. Over 120 species of birds rely on waters, beaches, barrier islands, and wetlands of the northern Gulf coast for nesting and wintering. Breeding species of regional importance include oystercatchers, skimmers, gulls, terns, plovers, herons, egrets,

and waterfowl. Marsh birds (i.e., rails, bitterns, sparrows) forage and nest in Gulf Coast marshes. The Department has federal lands in the northern Gulf that support birds including the Gulf Islands National Seashore, Breton National Wildlife Refuge, Bon Secour National Wildlife Refuge, and others. For example, the Breton National Wildlife Refuge supports one of the world's largest colonies of sandwich terns. The Gulf of Mexico is a key wintering area, providing Federally-designated critical habitat for the Federally-listed threatened piping plover (*Charadrius melodus*). Additionally, the northern Gulf Coast supports nearly half of the southeastern population of brown pelican and also includes portions of three of the major four migration flyways in North America: the Central, Mississippi, and Atlantic Flyways.

Birds become oiled while floating, wading, walking along beaches and marshes and while feeding. For example, brown pelicans float on the water near shore and in bays. Also, when flying they dive into the water to catch and eat fish. Both those activities have the potential for a brown pelican to become oiled if oil is present. Shorebirds such as sanderlings, which often inhabit sandy beaches and feed along the tide line, could get oiled on the beach or while trying to catch small invertebrates and mollusks if oil is present in the area. Similarly, clapper rails, which inhabit salt marshes and mangrove swamps, could become oiled if oil is present while they wade and forage for small crustaceans and crabs, and minnows. Numerous birds feed on estuarine fish, shellfish, crustaceans, bivalves and many other foods found in Gulf waters and along shores and marshes. By doing so, they risk skin and feather contact as well as ingestion of oil.

Avian injury resulting from the spill may be identified through various impacts including but not limited to mortality, changes in reproductive success (e.g., changes in reproductive behavior, decreases in successful hatch), and other sub-lethal effects. Direct exposure to oil interferes with the structure of feathers and reduces water repellency and insulation. This causes birds to lose buoyancy and to sink or lose the ability to stay warm. Oiled birds often display diminished abilities to fly, search for food, or swim and float, all of which can lead to mortality. In addition, birds may ingest oil while cleaning (preening) their feathers, by consuming contaminated vegetation or prey, or by incidental ingestion of contaminated sediment. Oil ingestion may kill the bird immediately or lead to long-term physiological, metabolic, developmental, and behavioral effects, ultimately reducing survival and reproduction. Oil transferred from adult bird feathers to their eggs can reduce the hatching of eggs and decrease survival of young.

In addition to direct oil exposure, birds are also negatively affected by habitat degradation, loss of habitat, decreased prey abundance, and physical disturbance. Oiled vegetation used for roosting or nesting may die back, resulting in a loss of available habitat. Oiled sand or mud may reduce invertebrate populations, which are important prey resources for foraging birds. Colonial nesters may be forced to abandon nests due to frequent spill-related cleanup activities. Such changes in habitat quality/availability and prey resources exert secondary impacts on birds that already may be suffering physiological effects of oil exposure.

Oiled birds were observed shortly after the spill began, and continued to be observed into the spring of 2011, more than half a year after the wellhead was capped. More than 8,500 birds were recovered in the northern Gulf of Mexico as part of wildlife response and NRDA operations. These birds represent more than 100 species collected from areas along all five Gulf States. Due to the geographic extent and duration of the spill, the limited persistence of dead birds in the environment, and the complexity of affected habitats, only a small percentage of areas could be effectively searched on a consistent basis. As a result, the number of birds recovered represents only a fraction of the birds that were killed or incapacitated by the spill.

The Trustees are quantifying the number of birds killed by exposure to oil using two primary approaches. The first approach, the Beached Bird Model (BBM), is being used to estimate avian mortality during the part of the spill when active searches for dead and dying birds were taking place. The BBM incorporates factors to account for affected birds that were not recovered, such as 1) the deposition and persistence of birds on shorelines, 2) the ability of survey crews to locate and recover birds, 3) the deposition of carcasses under non-spill conditions, and other factors. A number of studies were conducted to generate this information for inclusion in the model. While this model is still under development, preliminary data suggest that tens of thousands of birds likely died within the initial five months of the spill.

A second approach, the Live Oiled Bird Model (LOBM), is being used principally to estimate the number of oil-exposed birds that died after the period of active bird searches. This model incorporates factors such as: 1) the numbers of birds occurring in areas affected by the Oil Spill (abundance), 2) the incidence and degree to which birds were oiled (oiling rates), and 3) the fate of oiled birds (i.e., the likelihood an oiled bird would die). A number of studies were conducted to generate this information for inclusion in the LOBM, some of which are ongoing and the model is still under development.

In addition to these two models, the Trustees are also investigating additional approaches for identifying and quantifying bird injuries from the Oil Spill that may not be captured in the two primary approaches.

One of these additional approaches is to evaluate response injury as category of potential injury to birds resulting from the spill and spill-related activities. While best management practices (BMPs) were developed and employed to mitigate impacts to birds and other resources, some impacts occurred. Nesting and non-nesting birds were subject to some unavoidable impacts even with the use of BMPs. Cleanup operations on beaches, an important habitat and nesting area for many bird species, ranged from lightly to heavily intrusive. Alteration of local habitat during cleanup operations can impact species-specific site selection, behavior, and nest success (reproductive success). Beach-cleaning activities, which included the use of equipment during response activities, could increase egg and nestling exposure to the elements, or cause premature departure from nests by fledglings, individual adult nest abandonment, or entire colony abandonment of nests.

Another potential type of injury is the effects to *Sargassum*. *Sargassum* is an important resting and forage resource for pelagic birds, gulls, pelicans, and other birds. In addition to the oiling of marshes, beaches, and mudflats, floating mats of *Sargassum* were oiled during the course of the spill. Initial analysis indicates that more than 150 square miles of *Sargassum* were oiled. It is uncertain what impact this may have had on the birds that depend on this habitat for resting and foraging, however oiling of this resource would 1) provide an avenue of direct oiling of birds, 2) provide a pathway for oil ingestion by birds, and 3) directly reduce food available to birds in the form of marine fish and invertebrates that are associated with the *Sargassum* mats.

Both oiling of the shoreline and the response actions taken to address the oiling can also decrease food availability for birds. For example, the wrack zone, the area on the shore at the high tide line and where aquatic plants, animals and natural debris are deposited, is an important feeding area for birds. Hundreds of miles of wrack were removed from beaches as part of the response action.

Additionally, oiling of both marsh and beach causes a decrease in invertebrate species, which may, in turn, negatively impact birds dependent on them for food. The intrusive response activities taken on beaches and the prolonged time period over which they were taken (months to years) only exacerbate the potential concern over foraging impacts, since both the re-oiling and the cleanup would impede the rate of recovery of these important forage species. The extent of the *Deepwater Horizon* Oil Spill increases the concern of these indirect impacts. In other spills it may have been possible for birds to relocate to nearby, non-impacted areas, however, the extent of this spill makes mere relocation less likely.

DOI Activities and Level of Effort

To develop the overall injury assessment strategy, Department staff engaged in an intense collaborative effort that included both regional and national experts as well as coordination with co-Trustee technical staff. To evaluate potential injury, assessment concepts were developed, which required lengthy literature reviews, additional consultation with experts, and collaboration with members of appropriate technical teams.

From these collaborative efforts a series of injury work plans, based on the best available science, have been and continue to be designed to collect data to determine the avian injury. For example, during 2014 staff will continue to determine the appropriate avian toxicology work plans to develop based on previous activities and case needs. Department staff manage the preparation of individual work plans, by developing plan goals and objectives, identifying and selecting appropriate study data types, the scope/scale of data collection efforts, and evaluation approaches. Once these factors are agreed upon, Department staff develop preliminary drafts of work plans and Standard Operating Procedures (SOPs) for data collection, obtain Department review and approval, and facilitate technical team and co-Trustee review and approval. Work plans and SOPs are modified, as appropriate, based on technical input from co-Trustees, BP, and their contractors.

Some studies evaluate injury to a wide range of bird species while others focus on specific avian guilds or species. Department staff continue to manage the efforts of numerous work plans, including those for colonial waterbirds, secretive marsh birds, breeding shorebirds, non-breeding shorebirds, pelagic birds, raptors, waterfowl, wintering open-water waterbirds, and the piping plover.

Work plan implementation requires Department staff to participate in the development of contracting documents such as scopes of work and performance plans, and in their review and approval by contracting officers and attorneys. Department staff also participates in contractor selection and pre-award meetings. Staff serve as contracting officer representatives, and routinely provide input and oversight for development of protocols for data collection and specimen handling, chain of custody requirements, data entry, data quality review, analysis, and reporting.

Extensive co-Trustee and principal investigator coordination by Department staff is necessary with each avian injury assessment activity from identification and development of the study, oversight of end-of-study report preparation, and approval of those reports. The Department staff continue to bring all avian injury determination activities to the final report stage. Many of these efforts are ongoing and are designed to improve the accuracy of the avian injury quantification models.

Additionally, Department staff continue to collectively work to integrate the findings of each assessment activity that they have championed through the process into the comprehensive and holistic picture of the avian injury from this spill. This holistic avian injury can only be realized through the careful consideration, together with our co-Trustees, of the various contributions of each study.

RP Involvement

The Department is the lead for the avian injury assessment. Together with our co-Trustees, we have worked cooperatively with BP throughout the exposure and injury assessment phases. We have coordinated with BP or their designated representatives on a regular basis (typically weekly calls and/or meetings) during the design of each study and its implementation. BP representatives were also provided an opportunity to review and comment on most work plans and subsequent addenda. Work plans were often revised to address comments that BP provided. BP representatives also participated in field data collection effort for most of the cooperative studies. Data from cooperatively funded plans were shared with BP as soon as practicable (usually at the end of each day of field data collection). The Department also agreed to provide BP the data from non-cooperative plans upon completion of the studies. The Trustees are also working cooperatively with BP in the verification and validation of data from cooperative studies. As agreed upon with BP, the interpretation of data and the production of the Trustee-internal interpretive reports will be conducted independently of BP. Accordingly, data evaluation plans may not have been shared with BP.

This general cooperative process applies to the assessment activities discussed below. Additional information on cooperation with BP for specific activities is provided, as appropriate.

Overview of assessment activities:

1. Beach Bird Model Surveys and Supporting Studies
From May through September 2010, Department staff and contractors surveyed designated shoreline transects to collect information needed for the BBM, such as length of the shoreline searched, frequency of searches, and numbers of bird carcasses and impaired live birds recovered. The Department conducted additional studies to generate information needed to reduce uncertainty in the BBM, such as the persistence of bird carcasses on Gulf shorelines, the ability of survey crews to effectively search and recover birds, the probability that a bird that died on the water would be deposited on a shoreline, and the deposition of bird carcasses under non-spill conditions. Data generated under some of these activities have been incorporated in the BBM; other data will be incorporated in the BBM in 2015. The Department and co-Trustees are continuing to refine the model and model inputs.

With the exception of the Marsh Edge Searcher Efficiency and Carcass Persistence Studies, data collection activities were cooperative with BP. However, all data from both cooperative and non-cooperative surveys and studies have been shared with BP.

2. Aerial Bird Surveys
Aerial surveys were conducted to document the densities and abundance of waterbirds and seabirds in areas potentially affected by the Oil Spill. Data acquired in the surveys support the LOBM and other avian injury studies. Surveys included offshore (pelagic) transects, shoreline surveys, marsh transects, and breeding colony surveys. Arial surveys have been completed and the data validation effort is ongoing. These data are currently being jointly interpreted by the Department and co-Trustees for use in the development of our avian injury quantification models.

3. Marsh Birds
Injury to marsh birds is being assessed using a combination of surveys to evaluate relative densities, oiling rates, and comparison of mortality rates in oil-impacted areas and non-impacted reference areas. Density estimates were derived using secretive marsh bird callback surveys, fiddler crab density estimates (a principal clapper rail food), and helicopter surveys. Oiling rate estimates were obtained by the capture and examination of marsh birds. Mortality rate estimates of two representative species (clapper rails and seaside sparrows) in oiled and un-oiled habitats are being estimated using radio telemetry techniques, literature review, and avian toxicity testing. In 2014, we are working to finalize the remaining studies described above. We are also using the information provided by these studies to estimate the number of birds that were injured, while being careful not to overlap with other injury quantification efforts. The nature of marsh birds dwelling on the interior of the marsh makes this estimation worthy of careful consideration between our co-Trustees with whom we are exploring various integration methods.

4. Colonial Waterbirds
Injury to colonial nesting birds is being assessed using a combination of surveys to evaluate abundance within the northern Gulf of Mexico, estimating the proportion of birds that are visibly oiled and comparing survival rates of oiled and un-oiled adult birds. Colonial waterbird abundance estimates were derived from aerial surveys. The incidence and degree of external oiling of birds were obtained by surface observation of bird colonies, roosting sites, and other bird congregations in the northern Gulf of Mexico. Survival rate estimates of oiled and un-oiled adult birds from three representative species (great egret, brown pelican and black skimmer) are being derived using radio and satellite telemetry techniques, literature review, and avian toxicity testing. Field data collection efforts have been completed and the data validation effort is ongoing. These data are currently being jointly interpreted by the Department and co-Trustees for use in the development of our avian injury quantification models.

The Colonial Waterbird Study was initially cooperative with BP, but BP opted to discontinue cooperation in late 2010 during the field oiling rate surveys. All data for both cooperative and non-cooperative components of this study have been shared with BP.

5. Breeding Shorebirds
Injury to nesting shorebirds has been assessed by surveying breeding pairs of American oystercatchers and plover species throughout the spill's area of potential impact. This year we are using these data to estimate the proportion of adult birds that were oiled and note disturbance related to Oil Spill response activities. Surveys of breeding shorebirds in Alabama, Mississippi, and Louisiana have been conducted and we are using the results of the 2010 and 2011 surveys to examine differences among beaches, States, and species.

BP did not participate in this study. However, all data from this study have been shared with BP.

6. Non-breeding Shorebirds
Injury to shorebirds wintering in the northern Gulf of Mexico is being assessed using a combination of surveys to evaluate abundance, estimating the proportion of birds that are visibly oiled and comparing survival rates of oiled and un-oiled adult birds. Shorebird abundance estimates were derived from aerial surveys. Oiling proportion estimates were obtained by surface observation of foraging and roosting sites from Texas to Florida. Survival rate estimates of oiled and un-oiled adult birds from one representative species (American oystercatcher) were derived using radio telemetry techniques, literature review, and avian toxicity testing. Field data collection efforts have been completed and the data validation effort is ongoing. These data are currently being jointly interpreted by the Department and co-Trustees for use in the development of our avian injury quantification models.

7. Pelagic Birds
Injury to pelagic seabirds was assessed using a combination of ship-based surveys to evaluate offshore seabird diversity and abundance, estimating the proportion of birds that are visibly oiled, and comparing survival rates of oiled and un-oiled adult birds. Aerial surveys were also used to estimate seabird densities and abundance. Field data collection efforts have been completed and the data validation effort is ongoing. These data are currently being jointly interpreted by the Department and co-Trustees for use in the development of our avian injury quantification models.

This study was initially cooperative with BP, but BP opted to discontinue participation in late 2010. All data from the cooperative and non-cooperative components of this study have been shared with BP.

8. Piping Plover
Injury to Federally-listed threatened piping plovers was assessed by estimating the number of piping plovers in oiled and reference areas during the winter, documenting the frequency and degree of oiling, and evaluating over-winter survival of piping plovers in these areas via color band marking and re-sighting activities. The trustees also evaluated the return of marked piping plovers to the nesting areas in summer 2011. In 2014, the Department continues to work with co-Trustees to finalize the report on these data as we jointly interpret them for use in the development of our avian injury quantification models.

BP did not participate in this study. However, all data from this study have been shared with BP.

9. Raptors
The trustees evaluated potential spill-related mortality in two piscivorous raptors species: bald eagle and osprey. Studies included a rapid assessment of oiling effects and response activities on osprey reproduction in 2010, an assessment of bald eagle and osprey nests and reproductive productivity in 2011 and documentation of the presence of oiled nesting material in osprey nests in 2011. In 2014, the Department is working with co-Trustees to finalize the report on these data as we jointly interpret them for use in the development of our avian injury quantification models.

10. Waterfowl
Injury to waterfowl was assessed by estimating abundance and distribution within oil impacted marshes, open water habitats and along beaches, and documenting dead and live oiled wintering waterfowl via boat surveys within aquatic habitats and open waters; and walking beach surveys. Target birds included diving ducks, dabbling ducks, and geese with a special focus on resident mottled ducks known to over-winter within the Oil Spill area. In addition, this assessment evaluated oiling impacts of submerged aquatic vegetation (habitat which provides principal dietary items for a number of waterfowl species) as well as searcher efficiency of field survey crews attempting to locate waterfowl carcasses in marsh habitats. Field data collection efforts have been completed and the data validation effort is ongoing.

These data are currently being jointly interpreted by the Department and co-Trustees for use in the development of our avian injury quantification models.

11. Wintering Open Water Waterbirds
Injury to birds over-wintering in coastal open water habitats within the spill area were assessed by estimating target species (common loons, American white pelicans, and northern gannets) abundance and distribution derived from aerial and surface-based surveys (beach and boat) and documenting the incidence and degree of external oiling. Field data collection efforts have been completed and the data validation effort is ongoing. These data are currently being jointly interpreted by the Department and co-Trustees for use in the development of our avian injury quantification models.

BP did not participate in this study. However, all data from this study have been shared with BP.

12. Colonial Waterbird Photo Census
Beginning in 2010 and continuing through 2013, photographic surveys of waterbird breeding colonies in the northern Gulf of Mexico were conducted to evaluate potential effects to colonial nesting birds. The evaluation of photographs continues in 2014. Colony census data are currently being jointly interpreted by the Department and co-Trustees for use in the development of our avian injury estimates.

13. Blood Physiology Assessment
Polycyclic aromatic hydrocarbons found in crude oil have been associated with a variety of adverse effects in birds, including oxidative damage to red blood cells and other physiological effects. Such effects may compromise a variety of vital functions in birds, such as the ability to fly, swim, forage, migrate, and reproduce. This assessment activity evaluates physiological effects in birds to determine if hemolytic anemia and other physiological effects are key diagnostic features in birds oiled by the *Deepwater Horizon* Oil Spill. Field data collection efforts have been completed and the data validation effort is ongoing. These data are currently being jointly interpreted by the Department and co-Trustees for use in the development of our avian injury quantification models.

BP declined participation in this study. However, all data from this study have been shared with BP.

14. Avian Toxicology
The lethal effects of heavy oiling to birds is well-known from many oil spills around the world and, as expected following the *Deepwater Horizon* spill, many oiled bird carcasses were recovered from shoreline areas along the Gulf of Mexico. However, there were also many more birds observed during and after the spill that were oiled and still alive.

An extensive literature survey conducted by the Department has illustrated that while there is a large body of work on some specific effects of oil spills on birds, there is a distinct lack of information that provides for a systematic and integrated understanding of the

relationship between oil exposure and the full extent of effects on avian physiology and behavior. Literature studies show that when ingested by birds at levels less than acutely lethal, oil can cause a wide range of adverse effects, ranging from anemia (loss of oxygen-carrying capacity of blood), decreased nutrient absorption and energy absorption from food, altered stress responses, and decreased immune function. External exposure reduces a bird's thermoregulatory ability and can affect flight performance. For the *Deepwater Horizon* Oil Spill, these longer-term injuries to birds may be of particular importance for the tens of thousands of birds that were exposed to MC-252 oil but did not suffer immediate mortality.

The general approach of our work in this area is to conduct a series of studies on the toxicology, exposure, and longer-term effects of *Deepwater Horizon* oil on Gulf of Mexico relevant bird species to help inform avian injury determination and quantification. There are four components to the avian toxicology efforts: 1) an oral dose-response study, 2) an external oiling dose-response study, 3) a metabolic, thermoregulatory, and flight performance effects study, and 4) a field-based flight effects study. All of these components are ongoing, and therefore require extensive Department staff involvement.

In 2014, the Department will work with co-Trustees to finalize reports on data generated to date as we prepare to conduct further assessments of avian fate after oiling. It is critically important that we dedicate considerable effort with our co-Trustees on the estimation of fate that these data are revealing to us together with relevant literature. We will continue to jointly interpret these draft data with co-Trustees for use in the development of our avian injury quantification models.

BP declined participation in this study. However, the Department has agreed to share all data from this study upon completion of the study.

15. Background Carcass Deposition

In 2013, the Department, in coordination with co-Trustees, requested adjudication from the NPFC for an assessment plan entitled *Background Deposition of Bird Carcasses on Walkable Shorelines and Marshes*. This plan was initially described in the Department's Second Interim, Partial Claim (2013 IPC Activity #5). Funds for contractor support were adjudicated in 2014 and the Department committed considerable staff resources in coordination with co-Trustees, contract document development and refinement, logistics planning, and planning for the use of data generated by this study in Avian Injury Quantification models. These assessment efforts need to be conducted over the same months as when the spill occurred. While significant 2014 staff time will be spent developing work plans and schedules, because funding was received late during the time period of interest, the beginning of the field component will be delayed until 2015.

BP declined participation in this study. However, the Department has agreed to share all data from this study upon completion of the study.

16. Background Oiling Rate

In 2013, the Department, in coordination with co-trustees, requested adjudication from the NPFC for an assessment plan entitled *Background Oiling Rate for Live Birds*. This assessment activity was included in the Department's Second Interim Partial Claim (2013 IPC Activity #7). Funds for contractor support were received in 2014. Department staff have committed considerable resources in coordination with co-Trustees in revising study plans, contract document development and refinement, logistics planning, and planning for use of data generated by this study in Avian Injury Quantification models. It is anticipated that collection of field data will begin in late 2014 and continue throughout 2015.

BP declined participation in this study. However, the Department has agreed to share all data from this study upon completion of the study.

17. Avian Data Management

In 2014 the Department will continue to work with co-Trustees to finalize numerous reports on the avian assessment activities described above as we jointly interpret them for use in the development of our avian injury quantification models. The Department's 2014 avian assessment activities also include a focus on data management activities, such as additional quality assurance/quality control activities, including data verification and validation, in coordination with co-Trustees and BP. Additional effort will be focused on the development, review (including peer review), and finalization of deliverables such as data reports and interpretive reports.

In 2014, DOI staff are engaged in overseeing and coordinating all of the above mentioned assessment activities. DOI Staff participating in the Bird injury assessment have continued to coordinate the finalization of injury assessment studies, working with the study Principal Investigators, co-Trustee staff, and DOI team members to finalize data analyses, finalize reports, finalize the data verification and validation for each study, support the injury assessment contractors in their development of the comprehensive bird injury quantification, and manage the contracts of those contractors.

Principal Investigators

Department staff efforts related to this activity are identified and described in this section, but the associated Department personnel and travel costs are accounted for under Activity #14, DOI Injury Assessment, Restoration Planning, and Case Management. The senior Department staff involved in the bird injury assessment effort are Mike Hooper, Jon Hemming, Peter Tuttle, Veronica Varela, James Haas, and Dan Esler. Other Department staff involved in this effort are Clint Jeske, Jesse Arms, Melissa Collins, Erin Chandler, Donald Michael Fry, Katherine Ann Healy, Damian Higgins, Patricia Holland, Dianne Ingram, Paige Martin, Moira Ann McKernan, Ashley Mills, and Guthrie Zimmerman.

Additional information about DOI staff efforts related to the integration of migratory bird exposure and injury assessment, for which contractor support will be requested in 2015, is provided below.

2014 IPC # 3: Integration of Migratory Bird Exposure and Injury Assessment

Purpose of Activity and Injury Assessment Need

The Department must integrate the findings of all avian exposure, pre-assessment, and injury assessment activities performed as part of the *Deepwater Horizon* Oil Spill NRDA into a comprehensive discussion regarding the effects of the *Deepwater Horizon* Oil Spill on birds and their supporting habitat. This effort will produce a Trustee bird interpretive report summarizing data and findings for all of the migratory bird assessments. We must coordinate data and information generated by the Trustees through other activities and studies completed as well as other relevant and publically available data in order to produce a comprehensive accounting of avian injuries resulting from the *Deepwater Horizon* NRDA. Integration of information will inform the Trustees' determination of appropriate restoration projects to compensate for injuries to migratory birds and their supporting habitats.

Deliverables Produced

This activity will integrate the findings from the dozens of migratory bird Pre-Assessment and Assessment Plans, associated interpretive study reports, and supporting materials into a unified, comprehensive avian assessment report. The report will address exposure, causation, and spill-related harm. The report will integrate the findings of the BBM, LOBM, estimates of lost avian productivity in 2010 and subsequent years, and habitat-related effects to bird survival and reproduction. The Trustees will exercise particular care to avoid double counting of resource injuries that may result from the application of multiple avian injury models and injury quantification activities. This effort will also consider the finding of injury assessment efforts for other (non-avian) resource groups.

During 2014, staff began efforts to identify individuals who are bird technical experts and who also have the breadth of understanding necessary to both integrate the Departments' assessment findings as well as explain injury and injury quantification for birds oiled during the *Deepwater Horizon* spill. Following the identification of experts, Department technical and legal staff will evaluate the potential experts' qualifications, conduct interviews, and then select a bird technical expert. Once a person is selected and he/she accepts this opportunity, meetings and reports transmittals are scheduled to begin providing the expert with the information necessary for description of the bird injury case. These efforts were initiated in 2014, and it is anticipated that more significant efforts will be undertaken during 2015.

Relationship to Other Activities and Data

This effort is intended to provide a comprehensive accounting of avian injuries resulting from the *Deepwater Horizon* NRDA. Accordingly, the findings of all avian assessment activities will be considered in the preparation of this report. This effort will also consider the findings of injury assessment efforts conducted outside of the bird resource group to identify and characterize the potential for spill-related injury to other (non-avian) ecosystem components to adversely affect bird survival and reproduction.

To provide for report consistency and continuity, a single Department staff person will coordinate and oversee the preparation of the comprehensive avian injury report. However,

this effort will require coordination of multiple Department personnel in the compilation, assimilation, evaluation, and interpretation of multiple avian injury assessment activities as well as non-avian injury assessment activities. This effort will also require extensive coordination with multiple Department contractors who are assisting with avian injury assessment. Close coordination with co-Trustees and other assessment efforts ongoing in the *Deepwater Horizon* NRDA will also be required.

Administrative Record

The Department team will continue to respond to requests for documents to complete the administrative record. This activity will include providing new documents and data related to fieldwork and/or analyses. The costs of the Department team in gathering and providing these records for Administrative Record purposes is captured here; the costs of capturing and processing these records for Administrative Record purposes is captured under the Administrative Record Tasks, Activity #12 in the Claim.

Principal Investigators

Department staff efforts related to this activity are identified and described in this section, but the associated Department personnel and travel costs are accounted for under Activity #14, DOI Injury Assessment, Restoration Planning, and Case Management. The senior Department staff involved specifically in the integration of migratory bird exposure and injury assessment are Kevin Reynolds, Veronica Varela, Dan Esler, and Clare Cragan.

Timeframe

This activity will be ongoing throughout 2014.

5. DOI Managed Lands and Facilities

5.1. 2014 IPC # 4: 2013 Addendum: Assessment of Jean Lafitte National Historic Park and Preserve ("JELA") Submerged Aquatic Vegetation

5.2. 2014 IPC # 5: 2014 Addendum: Assessing Recovery of Submerged Aquatic Vegetation Propeller Scars at Gulf Islands National Seashore ("GUIS")

Purpose and Injury Assessment Need

The Department is undertaking two assessments of injury to submerged aquatic vegetation (SAV) on DOI-managed lands and facilities.

In response to the MC 252 Oil Spill, Mississippi River freshwater flows through the Davis Pond Diversion to Lake Cataouatche were increased to reduce the potential for oil intrusion into the inland marshes, including Jean Lafitte National Historic Park and Preserve (JELA). Assessment data from JELA, obtained in 2010, 2011 and 2012, suggest that the SAV community in JELA was negatively affected by the increased freshwater flow to JELA during the Oil Spill response. Surveys were conducted to collect data on water quality

parameters, sediment and water nutrient levels, SAV community structure and floating aquatic species abundance and these data were compared to reference stations described in the Fall 2010 survey and the 2006-2007 Poirrier et al. (2009) survey (i.e., baseline survey). These assessments allowed for a before-after comparison of the JELA SAV community to assess potential MC 252 response secondary impacts over time.

The sustained increase in freshwater flow resulted in reduced salinities in JELA, as well as increased loads of nitrogen and phosphorous into the downstream system leading to JELA, throughout the summer and into the fall of 2010. Following these changes in the aqueous habitat, there were notable changes in SAV community structure, including significant reductions in SAV diversity in JELA from fall 2010 to fall 2012. Simultaneously SAV diversity at reference stations has significantly increased over the same period. These factors provide evidence that significant changes have occurred within the Preserve's ecosystem following response to the 2010 MC 252 Oil Spill. Field studies performed in the spring and fall of 2012 provided additional data to assess the magnitude and duration of potential damages.

The physical injuries to SAV in Gulf Islands National Seashore (GUIS) include propeller (prop) scars and blowholes. In 2012, BP funded Trustee emergency restoration of prop scars caused by response vessels in Florida; DOI and BP also entered into a cooperative agreement to assess recovery of 9 identified response-related propeller scars that were selected in the emergency restoration FONSI for natural recovery (no-action) at GUIS ("Deepwater Horizon/*Mississippi Canyon 252 Oil Spill Plan for Assessing Recovery of Submerged Aquatic Vegetation Propeller Scars at Gulf Islands National Seashore*). Pursuant to the Assessment Plan, initial field work was completed in July 2012. In spring 2013, the Department determined that field results did not meet the performance criteria defined in the Assessment Plan, at 5 of the original 9 sites. In spring 2013, DOI and BP entered into a cooperative agreement for additional field work in fall 2013 to assess recovery of those 5 identified response-related no-action propeller scars at GUIS. Monitoring of the no-action injury sites, including percent cover and shoot density, was necessary to permit the detection of and, if warranted, response to significant changes in seagrass recovery rates.

No additional samples were collected in 2014 as part of this assessment activity, but DOI staff continued reviewing and assessing previously collected data. In May 2014, the contractor supporting the JELA assessment effort, Weston Solutions, Inc., published a draft report on SAV injury in JELA. DOI staff have also participated in the ongoing review of interim reports on SAV injury in GUIS, in order to develop the restoration plan for compensatory injury.

Deliverables Produced

In 2014 NPS staff working on SAV in JELA and GUIS continued the processes of data verification/validation and follow-up with contractors. Work with contractors included receiving data and written reports. Additionally NPS staff began developing long-term restoration plans for the Damage Assessment and Restoration Plan (DARP). A draft report on SAV injury in GUIS was published in May 2014. No fieldwork has occurred in 2014.

Data verification/validation and work on the DARP restoration plans are both expected to continue in 2015.

Relationship to Other Activities and Data

As these assessments are occurring on DOI-managed lands, no other Trustees are participating in these activities. Monitoring data obtained from these activities are being used to inform early restoration and DARP planning.

Administrative Record

The DOI team will continue to respond to requests for documents to complete the administrative record. This activity will include providing new documents and data related to fieldwork and/or analyses. The costs of the DOI team in gathering and providing these records for Administrative Record purposes is captured here; the costs of capturing and processing these records for Administrative Record purposes is captured under the Administrative Record Tasks, Activity #12 in the Claim.

Principal Investigators

DOI staff efforts related to this activity are identified and described in this section, but the associated DOI personnel and travel costs are accounted for under Activity #14, DOI Injury Assessment, Restoration Planning, and Case Management. The senior DOI staff members involved in overseeing and coordinating the submerged aquatic vegetation assessment are Eva DiDinato and Jim Haas. Other staff members involved in this activity includes Heather Best, Jeremy Cantor, Cassity Bromley, and Jolene Williams. Weston Solutions, Inc., is providing contractor support for the JELA assessment effort, and Dauphin Island Marine Lab is providing contractor support for the GUIS assessment effort, under the leadership of Dr. Kenneth Heck.

RP Involvement

BP funded and worked cooperatively with the Trustees for the first three field studies for the JELA assessment, in fall 2010, spring 2011, and fall 2011. During the first three studies, BP had personnel in the field with the Trustees. Additional field studies were performed in the spring and fall of 2012; these provided additional data to assess the magnitude and duration of potential damages and were completed independently of BP.

GUIS SAV field work was cooperative and funded by BP. During GUIS field work BP personnel were present.

Timeframe

This activity will continue throughout 2014.

5.3. 2014 IPC # 6: Assessing Submerged Oil Mats by Remote Sensing Survey and Diver Characterization at Gulf Islands National Seashore

Purpose and Injury Assessment Need

More than three years after the *Deepwater Horizon* Oil Spill, NPS beaches at GUIS continue to be re-oiled by Submerged Oil Mats (SOMs). The SOMs continue to impact Department resources such as seagrass, sea turtles, fish, and threatened and endangered nesting shorebirds. These assessment activities will collect key data necessary to model the location, formation and re-suspension of the oil/sand mixture that constitute SOMs. Quantification of SOMs will allow NPS to delineate injured subtidal habitat for purposes of primary and/or compensatory restoration planning.

Several areas offshore of the beaches of GUIS have yet to be investigated visually for submerged oil related to MC 252. The first objective is to locate areas for potential trapped submerged or buried oil based on the topographical features beyond the first sand bar. These areas will be investigated visually once they are located by various remote sensing instruments. A secondary objective will be to develop an in-water method of detecting oil consistently with either visual survey methods or with diver handheld instruments.

Divers will be deployed to examine NPS bottomlands at GUIS with a high probability of having SOMs. These areas will be selected based on GIS data in the Environmental Response Management Application (ERMA; e.g. beach re-oiling, past oiling, predictive modeling and remote sensing data). Project boundaries will be the administrative boundaries of GUIS with specific locales as indicated by the data-mining and mapping effort.

Diver deployment will include direct visual examination of areas of interest combined with video and photographic documentation. Sub-surface sediments will be examined by using a hydroprobe and push cores in a systematic grid pattern in high probability areas. Remote sensing will consist of geo-referenced high-frequency side scan sonar coupled with a ROXANN acoustic bottom classification device to locate SOMs or seafloor topography that are conducive to SOM formation or concentration.

Deliverables Produced

Deliverables to be produced as a result of DOI and contractor efforts include:

- Report: The Submerged Resources Center (SRC) will produce a full written report including all results of the research objectives and a full analysis of all digital data. This report will include any effective methodologies developed in locating areas of potential trapped or buried oil, the effectiveness of the side scan and RoxANN sonars in identifying these areas, and our understandings and hypotheses about what factors lead to the formation, concentration, burial, exposure, re-suspension and deposition of SOMs. Details of where any submerged oil was found will be displayed digitally in the ArcGIS workspace and subsequent products.

- Data: Digital remote sensing data will be presented in a package in three forms: raw, processed and interpreted. Raw and processed data will be included on a hard drive, and interpretations of the digital data will be included in the final report as figures or images with corresponding descriptions. All digital photography, ArcGIS files, scanned written notes, and scanned hand drawn maps will also be included in the digital package. Requests for 2014 project digital data will be fulfilled if needed by park managers and NPS Environmental Quality staff prior to the completion of the final report and data transmittal. Data collected from this sampling will be directly comparable to historic data (2006-2007) and SCAT/NRDA data (2010-2011).

Data files for the SOM field effort in summer 2014 have been provided. Data from the fall 2014 field assessment (if performed) and a project report will be provided in 2015.

Relationship to Other Activities and Data

These SOM assessment activities will be managed and administered by the NPS Submerged Resources Center. The Submerged Resources Center will coordinate directly with Gulf Islands Resources staff and external collaborators working on similar issues as part of the *Deepwater Horizon* response. None of the other Trustees are participating in the GUIS SOM assessment; NOAA led a shore-based SOM assessment in 2011 but this effort has not been ongoing.

Administrative Record

The DOI team will continue to respond to requests for documents to complete the administrative record. This activity will include providing new documents and data related to fieldwork and/or analyses. The costs of the DOI team in gathering and providing these records for Administrative Record purposes is captured here; the costs of capturing and processing these records for Administrative Record purposes is captured under the Administrative Record Tasks, Activity #12.

Principal Investigators

DOI staff efforts related to this activity are identified and described in this section, but the associated DOI personnel and travel costs are accounted for under Activity #14, DOI Injury Assessment, Restoration Planning, and Case Management. Senior DOI staff involved in overseeing and coordinating the submerged oil mats assessment are Dave Conlin and James Haas. Other DOI staff involved in this effort include Bert Ho, John Bright, Kara Davis Fox, Andres Diaz, Jessica Glickman, Susanna Pershern, Arthur Ireland, Jessica Keller, and Desiree Sousha.

RP Involvement

In 2013, BP funded contractor support for DOI's SOM assessment activities which commenced in spring 2014; BP did not have representatives in the field for this effort.

Timeframe

This activity will be ongoing throughout 2014.

6. Other Assessment Activities

6.1. 2014 IPC # 7: Sand Beach Injury Assessment

Purpose and Injury Assessment Need

Beaches across the Gulf have experienced surface and subsurface oiling as a result of the *Deepwater Horizon* release. Re-oiling from re-mobilization of buried oil and submerged oil mats in the nearshore environment is continuing today. These oiling events, along with the initial release of oil have exposed natural resources to oil and have required response actions to remove oil from sand beaches from Florida to Texas. These response actions have used and are using various manual and mechanical methods to remove oil and debris from the sand beaches that have resulted in modification or impairment of these habitats and caused injury to natural resources ("Response Injury"). In addition, a literature review on the effects of oil in beach habitats, conducted by co-Trustees working on the Shoreline assessment, further supports the finding of some level of injury due to habitat modification and oil fouling, as compared to unoiled beaches. As the oiling of beaches and response continues, the Department and co-Trustees continue to assess impacts to sand beach habitats due to both *Deepwater Horizon* oiling and injury caused by response actions.

Studies have demonstrated a negative relationship between oiled beaches and beach invertebrate communities and habitat quality. Oil-related sand beach injury is being assessed by the Trustees using the shoreline oil exposure map currently under development within the Shoreline technical team. This map outlines the extent, duration, and degree of oiling across various stretches of shoreline impacted by the *Deepwater Horizon* incident. The oil-related sand beach injury assessment will include evaluation of the likely impacts for the different oiling exposure categories and will determine the degree of impacts to sand beach ecosystem services.

Coupled with oil-related injuries, the Department and co-Trustees are also assessing the effects of Response Injury on sand beach habitats. The objective of the sand beach Response Injury assessment is twofold. First, to compile the various sources of information that may be used to assess injury related to response actions on the shoreline and second, to categorize and rank the effects of the response action on the sand beach habitat. The information on the temporal and spatial extent of response-related injuries is scattered among many organizations, agencies, and databases and has been difficult to obtain. (See description of assessment activity 2014 IPC #8: Response Information Data Management, Infrastructure, Administration and Assessment.)

As of June 2013, the response actions were deemed complete for the shorelines in Florida, Alabama, and Mississippi. Once a shoreline segment is moved out of response, the U.S. Coast Guard and BP have established the Middle R program. In Louisiana, shoreline cleanup operations on sand beaches extended for a longer period. As of February 2014, there were seven miles of sand beaches still in active treatment in Louisiana. The Department is continuing to record impacts associated with the buried oil removal activities in these areas,

as activities are expected to have significant impacts on the sand beach invertebrate fauna and cause disruption to use by avian species in these areas.

Tasks related to sand beach injury assessment in 2014 fall into three assessment categories within the context of the ongoing NRDA: 1) Sand Beach Oil Exposure and Injury Quantification, 2) Sand Beach Response Injury Exposure and Injury Quantification, and 3) Comprehensive Sand Beach Injury Quantification. As such, the Department is utilizing contractor support (previously funded by BP) in 2014 for three purposes: 1) to develop an updated analysis of sand beach injury resulting from the MC 252 historic and current releases as part of the ongoing NRDA, 2) to acquire and organize new information obtained as part of the response injury data management efforts that are responsive to the categories of potential injury and/or correlating response actions previously identified, and 3) to update the comprehensive beach injury assessment technical report with information gained from the ongoing response and coordination with the response injury data management efforts.

Deliverables Produced

Deliverables to be produced as a result of these contractor efforts include:

- Sand beach injury analysis: Contractors will produce an updated analysis of sand beach injury resulting from the Oil Spill, including historic and current releases and response activities as part of the ongoing NRDA. The associated oiling and response injury categories and extents will be utilized, along with literature-based evaluations and other studies currently underway, to determine the degree of impacts to sand beach ecosystem services. This work will include evaluation of the likely impacts for the different oiling exposure and response injury categories for sand beach habitats. The contractor will also work collaboratively (in order to avoid any duplication of efforts) with the principal investigators of relevant studies to characterize the impacts of oiling and response activities to beach fauna.
- New information acquired and organized as part of the response injury data management efforts: The identification and collection of information about previous and ongoing response efforts for the MC 252 incident are not completed. Work is continuing on cooperative response injury data management with BP. To more clearly define the extent and duration of injury to the sand beach habitat, the contractor, working with DOI and its co-Trustees, will acquire and organize new information obtained as part of the response injury data management or other State efforts that are responsive to the categories of potential injury and/or correlating response actions previously identified.
- Updated comprehensive beach injury assessment technical report: To fully evaluate the effects of the MC 252 release on the beach habitat, the contractor will update the comprehensive beach injury assessment technical report with information gained from the ongoing response and coordination with the response injury data management efforts. This comprehensive report will join the oiling component of

injury using the degree and spatial extent of oil-related injuries to sand beaches over time (Activity #1) with the assessment of response injury (Activity #2). This assessment activity will result in a comprehensive beach injury technical report for 2014.

Relationship to Other Activities and Data

The Department is the lead Trustee for assessing oil and response injury to the sand beach habitat resulting from the Oil Spill and continues to work closely with co-Trustees, coordinating efforts to identify and quantify injuries to the sand beach habitat. It is anticipated that the final sand beach injury will quantify injuries to Federally-owned and State-owned lands. The Department is working to exchange information on response activities that are incorporated into the assessment, solicit comments, and address individual Trustee concerns while continuing its efforts to quantify the sand beach injury.

Administrative Record

The DOI team will continue to respond to requests for documents to complete the administrative record. This activity will include providing new documents and data related to fieldwork and/or analyses. The costs of the DOI team in gathering and providing these records for Administrative Record purposes is captured here; the costs of capturing and processing these records for Administrative Record purposes is captured under the Administrative Record Tasks, IPC #12.

Principal Investigators

DOI staff efforts related to this activity are identified and described in this section, but the associated DOI personnel and travel costs are accounted for under Activity #14, DOI Injury Assessment, Restoration Planning, and Case Management. The senior DOI staff member involved in overseeing and coordinating the sand beach injury assessment is Charles Wood.

RP Involvement

The Department as the lead for the assessment of sand beach injuries, along with our co-Trustees and NOAA, has worked cooperatively with BP throughout the exposure assessment phases. Weekly coordination calls were conducted through the shoreline technical workgroup. Data collection was conducted under a cooperative work plan with BP. However the interpretation of data which began in 2012 and the production of the Trustee-internal interpretive reports will be conducted independently of BP.

Timeframe

This activity will be ongoing throughout 2014.

6.2. 2014 IPC # 8: Response Information - Data Management, Infrastructure, Administration and Assessment

Purpose and Injury Assessment Need

Response activities related to the *Deepwater Horizon* oil spill are continuing four years after the wellhead was capped. In addition, re-oiling is still occurring in some places and warrants the

continuation of response actions. The geographic scope and duration of the Oil Spill has created a voluminous record of information, reports, and other documentation related to response actions. This information is useful for the Trustees to quantify response-related injuries to natural resources and their services. Response Injury is an injury type separate from oil exposure and, in some cases, may significantly affect the recovery rates of different habitats and resources. As part of DOI's Second Interim Partial Claim the Trustees presented a work plan for technical support to identify and consolidate response information held by the U.S. Coast Guard relevant to the Trustees ongoing Natural Resource Damage Assessment for the Oil Spill into a relational database system. This work plan included two activities: 1) Development of a database and storage system for relevant data for response injury quantification and 2) Population of the response injury database with relevant data. The U.S. Coast Guard has made available to the Trustees nearly 12 terabytes of response information. However, the data is not in an accessible, easily searchable form and all the data may not be relevant to the Trustees NRDA objectives.

In May of 2013 the Trustees and BP met to discuss this work plan and response data held by BP. At this meeting it was agreed to revise the scope of work for this work plan into a technical support effort for the cooperative sharing of response data between BP and the Trustees. Work on the development of a cooperative data sharing agreement and scope of work for a new work plan progressed during the first quarter of 2014 but then stalled during negotiations surrounding the development of a confidentiality agreement between the Trustees and BP. Negotiations are expected to resume.

Deliverables Produced

This activity includes efforts to obtain, review and organize response information to be used by the Trustees to determine injuries to natural resources and their services. The Trustees will need to determine whether it will be possible to use existing databases (i.e., Coast Guard, BP) or whether they will need to develop and maintain a separate, searchable database to house response information. Before making this determination, DOI will continue negotiating with BP over a confidentiality agreement for data sharing.

Relationship to Other Activities and Data

The Department is the lead for the Trustees' Response Injury efforts, which involves close coordination with the Department's co-Trustees. Identification and organization of response documentation potentially demonstrating injury to natural resources and their services will be used to either support existing injury claims or alternatively develop injury claims separate and apart from ongoing assessment studies.

In May 2013, BP provided initiate funding for this activity in the amount of $739,959. A portion of the initial funding is being used to obtain technical support for the Trustees to discuss various technological interfaces and other technology related questions.

Principal Investigators

DOI staff efforts related to this activity are identified and described in this section, but the associated DOI personnel and travel costs are accounted for under Activity #14, DOI Injury Assessment, Restoration Planning, and Case Management. In 2014, senior DOI personnel

involved in response information data management discussions include James Haas, John Rudolph, Holly Deal, Pete Tuttle, and Charles Wood. Other DOI personnel involved in these negotiations include Mark VanMouwerik and Paige Martin.

RP Involvement

The Department as the lead for the assessment of response injuries, along with our co-Trustees and NOAA, has attempted to work cooperatively with BP for response activity data acquisition and management. Coordination calls are conducted through the response injury technical workgroup. Work continues to resolve current issues on the further development of a cooperative response injury data management work plan and confidentiality agreement.

Timeframe

Efforts related to this activity occurred during the first quarter of 2014 and are anticipated to resume later in the year.

7. Injury Assessment, Management and Administration

7.1. 2014 IPC # 9: 2014 Addendum: Technical and Logistical Support for DOI's *Deepwater Horizon* Oil Spill NRDA

Purpose and Injury Assessment Need

The Department leads several areas of the *Deepwater Horizon* NRDA (e.g., birds, sand beach, response information, nesting sea turtles, etc.). Numerous individual field and analytical work plans have been developed and are continuing to be developed as part of the ongoing NRDA. In addition, analyses and interpretation of data collected through individual DOI-led NRDA assessments are being generated. Support is needed to assist in managing the synthesis of ongoing assessment activities, including study implementation, Trustee coordination, and data analysis into a comprehensive and integrated injury case. The Department's efforts in this case-wide management effort will also provide the framework for the work that will be required to develop the Damage Assessment and Restoration Plan (DARP). The Department has trust resource responsibilities separate and distinct from NOAA and as such the Department's injury assessment and restoration planning efforts must be specific to our resources. However, the Department recognizes that natural resources for which we have trust responsibilities may benefit from NOAA-identified restoration goals and projects. Understanding NOAA's injury quantification and restoration efforts and working with the agency to develop a unified injury case and restoration plan avoids double counting and double recovery.

As previously identified, the Department requires assistance integrating all the individual assessment activities into a comprehensive and integrated injury case that leads to a DARP. To accomplish that goal, the Department seeks contractor support to accomplish the following:

A. Provide case-wide technical and logistical support to the DOI *Deepwater Horizon* NRDA case team for the variety of DOI-led assessment activities. Logistical support includes coordinating ongoing and planned assessment activities with co-trustees and BP, as appropriate. Logistical support also includes developing agendas and coordinating participation by the relevant individuals or parties including facilitating trustee and principal investigator interaction, and, where appropriate, interaction with BP. Logistical support includes oversight of the distribution and review of technical reports developed as part of the Assessment. Technical support includes both product development for parts of the Assessment as well as review of the individual assessment results and an evaluation of their contribution to the overall injury case. Technical support also includes the collection and analysis of information that is generally available in the literature or from experts knowledgeable about the effects of oil on natural resources. Technical support for the synthesis and integration of DOI-generated data and analyses with other ongoing activities to document exposure and injury to resources and their supporting habitat, including NOAA's shoreline, toxicity, and modeling efforts, is also needed. In addition, related but separate NRDA activities led by other co-Trustees are integral to improved understanding of the effects of the Oil Spill on natural resources. Collectively these efforts contribute to and support the Department's Assessment of the effects of *Deepwater Horizon* oil exposures and the injuries caused by the oil to natural resources for which the Department has trust responsibilities. These efforts began during 2013 and will become more extensive during 2014 and in future years until completion of the DARP.

B. Technical support services also include development and incorporation of a rigorous peer review process for reports and findings developed as part of the Assessment. A consistently applied peer review process with specific requirements will help improve reliability and ensure methods are standardized and analyses are defensible. Peer review of reports and findings is essential for confirming natural resource injury identification and quantification so that restoration goals and plans can be developed to restore injured natural resources. Development and incorporation of a peer review process was initiated during 2014 and will continue throughout 2015.

C. Data review that includes outside third party quality assurance/quality control (QA/QC) and data verification/validation is required so that the Trustees and the public can be assured that the data are accurate and complete. Various field and analytical work plans have been developed and implemented as part of the ongoing NRDA. Technical assistance is needed to facilitate third party data QA/QC and verification/validation activities on data collected pursuant to NRDA work plans where DOI is the lead. These efforts must be undertaken in coordination with co-Trustees and with BP. DOI initiated these efforts in 2013 and had increased the effort to be a focal area of the 2014 NRDA. Efforts include, but are not limited to:

    1. Assist Trustees to conduct transcription verification of data sets in the DOI *Deepwater Horizon* NRDA database, as needed.

2. Assist the Trustees, principal investigators, and BP to conduct data validation for the NRDA datasets and provide documentation, as necessary, of the data validation process.

D. The Department seeks contractor assistance in support of DARP development. Technical and logistical assistance is necessary to support the Department's efforts in establishing a comprehensive and integrated injury case and restoration-based claim which will provide the framework for supporting development of the Department's chapters of the *Deepwater Horizon* DARP. Within this effort NOAA's injury quantification and restoration efforts as well as separate NRDA activities and restoration goals led by other co-Trustees will need to be understood and incorporated into a unified DARP. These efforts will be initiated during 2014 and will become more extensive in future years until completion of the DARP.

Relationship to Other Activities and Data

As described in the Department's 2013 Interim Partial Claim, BP funded $1,188,628 for two assessment plans: *Quality Assurance and Quality Control Support for U.S. Department of Interior Managed Data Collected During the* Deepwater Horizon/*MC 252 Oil Spill Natural Resource Damage Assessment,* and *Technical and Logistical Contractor Support for U.S. Department of the Interior* Deepwater Horizon/*MC 252 Oil Spill Natural Resource Damage Assessment* for CY 2013. With these funds, the Department established a cooperative process for case-wide verification and validation of data and began that process. BP provided the Trustees with a list of priorities for cooperative verification and validation for bird data and that has been incorporated into our priorities. The Trustees and BP have successfully completed cooperative verification and validation of Searcher Efficiency study (BS #1B) data and Carcass Persistence study (BS #1C) data.

Currently, datasets undergoing final BP review in the cooperative verification and validation process are:

- Carcass Drift (BS #1D)
- Breeding Shorebirds (BS #8)
- Piping Plover Oiling and Abundance (BS #7)
- Jean Lafitte Submerged Aquatic Vegetation

We anticipate that in the near future many datasets will be shared with BP for cooperative verification and validation, such as, but not limited to:

- Non-breeding Shorebirds data (BS #5)
- Master Segment Dataset
- Master Birds Dataset
- Colonial Waterbirds Oiling data (BS #4)
- Pelagics Transect data (BS #6)
- Kemp's Ridley Nest Sample Collection data
- Master Search Effort dataset

- Loggerhead Nest Sample Collection
- Loggerhead Nesting Females data
- Waterfowl data (BS #10)
- Wintering Open Water Waterbirds data (BS #12)
- Secretive Marsh Birds Callback data (BS #3)
- Osprey Productivity data (BS #9)
- Pelagic Point Count survey data
- Aerial survey data
- Kemp's Ridley Nesting Female data
- Sturgeon data
- Beach mouse Habitat Assessment Plan data

Administrative Record

The DOI team will continue to respond to requests for documents to complete the administrative record. This activity will include providing new documents and data related to fieldwork and/or analyses. The costs of the DOI team in gathering and providing these records for Administrative Record purposes is captured here; the costs of capturing and processing these records for Administrative Record purposes is captured under the Administrative Record Tasks, Activity #12 in the Claim.

Principal Investigators

DOI staff efforts related to this activity are identified and described in this section, but the associated DOI personnel and travel costs are accounted for under Activity #14, DOI Injury Assessment, Restoration Planning, and Case Management. The DOI senior staff involved in providing technical and logistical support are Ashley Mills, Veronica Varela, Jon Hemming, Pete Tuttle, Kevin Reynolds, and Debora McClain. Other DOI staff involved are Erin Chandler, Paige Martin, and Kate Healy. Key contractor staff involved in this effort are James Dwyer, Alexandra VanGeel, Nadia Martin, Ann Jones, Nicholas Tyack, Alexandra Bothner, Meredith Amend, Adam Patisteas, and Jessica Murray (IEc).

RP Involvement

As described above, DOI coordinates the verification and validation, and quality control activities with BP. The Department does not interact with BP in conducting other activities in providing TLC support.

Timeframe

This activity will be ongoing throughout 2014.

7.2 2014 IPC # 10: Comprehensive Database for DOI-lead Studies, Analytical and Observational Data, Infrastructure and Administration

7.3 2014 IPC # 11: Comprehensive Document Management System for Assessment & Restoration Planning Records

Purpose and Injury Assessment Need

Since the oil spill begun, a large number of samples, instrument files, photographs, and visual observations have been acquired to quantify injury and to scale appropriate restoration needed because of the Oil Spill. The Department, in coordination with NOAA and the Data Management technical team, has led and continues to lead the effort to ensure the preservation of all such files and data for DOI-led plans. This effort has entailed tracking, storage, maintenance, and sharing of these data with relevant technical teams and the wider Trustee community. With limited exception, data generated from implementation of approved NRDA work plans for which the Department is the lead are/will be entered into the DOI *Deepwater Horizon* NRDA database (DOID).

Deliverables Produced

The key objective of these activities is to provide Trustee users with the ability to search, analyze, and retrieve the data by 1) preserving and managing DOI-led NRDA data in a single repository, and 2) aligning and integrating those data into the NOAA Data Integration, Visualization, Exploration, and Reporting (DIVER).In addition, DOID will be upgraded to communicate with NOAANRDA and the State of Louisiana's LOSDMS databases.

In 2014, DOI is focusing on the finalization of the DOID structure, integration of previously corrected and newly generated NRDA data (including incorporation of ongoing updates made to the data as identified through the verification/validation efforts under separate activities), and the transmission of these resulting data into DIVER for use by Trustees.

Relationship to Other Activities and Data

Full operation of the DOI *Deepwater Horizon* NRDA Database will enable the Trustees to deliver quality-checked datasets to BP, co-Trustees, and DIVER where, ultimately (upon approval by the *Deepwater Horizon* NRDA Trustee Council), the validated datasets will be made available to the public. The storage and management of data generated by DOI-led assessment activities are necessary to facilitate access to assessment files and data by the Trustees, BP and the general public. Furthermore, a comprehensive system ensures proper document and data preservation necessary for litigation.

The DOI *Deepwater Horizon* NRDA database will store data generated by DOI-led pre-assessment and assessment activities during this NRDA. The DOID is the source repository for all DOI-led NRDA data. Any updates and integration of these data is handled through DOID. All changes are recorded and links to associated files are maintained. Access to DOID is restricted to data management personnel and the principal investigators

responsible for communicating data updates. To provide end users with access to the data, DOID transmits data to DIVER, which is designed as the interface for intuitively searching the vast array of NRDA data collected as part of the assessment process.

Principal Investigators

DOI staff efforts related to this activity are identified and described in this section, but the associated DOI personnel and travel costs are accounted for under Activity 14, DOI Injury Assessment, Restoration Planning, and Case Management. Principal Department and contractor staff associated with this effort include Debora McClain and Gina Ballard (DOI); Daniel Hudgens and Matt Konopka (IEc), Jim Anderton and Mike Jackson (Solea).

Administrative Record

The DOI team will continue to respond to requests for documents to complete the administrative record. This activity will include providing new documents and data related to fieldwork and/or analyses. The costs of the DOI team in gathering and providing these records for Administrative Record purposes is captured here; the costs of capturing and processing these records for Administrative Record purposes is captured under the Administrative Record Tasks.

RP Involvement

DOI's data management efforts are conducted independently of the RP. The Department has not interacted with the RP as part of this activity, and the RP does not have access to the information being developed directly within the system.

Timeframe

This activity will be ongoing throughout 2014.

7.4 2014 IPC # 12: Comprehensive Document Management System for Assessment Administrative Record

Purpose and Injury Assessment Need

As the Federal Lead Administrative Trustee for this NRDA, the Department and the co-Trustees announced the establishment and opening of the Administrative Record for this NRDA (AR) on October 1, 2010 (See Notice of Intent to Proceed with Restoration Planning, 75 Fed. Reg. 06800, at 60802). The establishment of the AR is in accordance with 15 C.F.R. § § 990.44 and .45. The AR is publicly accessible and is intended to include documents considered by the Trustees during the pre-assessment, assessment, and restoration planning phases of this NRDA. The Department has lead responsibility for the AR; however the underlying effort to identify, collect, organize, review, and approve materials for inclusion in the AR involves all Trustees. The costs to provide for and maintain a sufficient AR have increased rapidly and exponentially as more data is collected, study plans are finalized, and technical reports are written. This activity supports the continued operation, management, improvement and use of the *Deepwater Horizon* Comprehensive Document Management System for Assessment Administrative Record.

Management of the Administrative Record reflects five major components, described in more detail below: (1) identification, routing, and management of legal records from the assessment; (2) leading co-Trustee, joint records management and coordination, including for Trustee Council level legal records management, legal reviews, and public accessibility; (3) contactor support to design, implement and manage the administrative record process from identification through approval and inclusion in the record; (4) hardware and data architecture for legal document management; and (5) external website support to facilitate public access and usability.

(1) Identification/management of legal assessment records for the AR from DOI-led or managed activities—Includes searches, collection, organization, routing, and management of AR records from DOI-led technical teams, NRDA operational support groups, et., that are candidate for inclusion in the NRDA AR;
(2) Leading joint legal management of records with co-Trustees—as the Lead Administrative Trustee, DOI will take a leading role in providing legal guidance for AR record searches, to define protocols and platforms for joint legal reviews, and will provide services appropriate to support AR decision-making processes at the Trustee Council level, including records management, joint legal review, redaction review for DOI records, and public accessibility;
(3) Development of a technology system to facilitate the efficient collection, review and disposition of candidate records for inclusion in the NRDA AR. In addition, to the architecture of the Administrative Record Review process, DOI will hire contractor support on behalf of the Trustees to manage the Assessment Administrative Record review process;
(4) Hardware and data architecture – Candidate Trustee records for the AR extracted from DOI's document management systems (described above) will be voluminous, and will only increase with inclusion of candidate records from other Trustees. Existing data and records management systems are not sufficient to support the Trustees' legal record review obligations for the AR and this NRDA. The Department intends to create a system for the AR that is compatible with NOAA's document management systems, as well as DOI's larger, more comprehensive document management system (described in activity above). An AR-focused document repository for the Department and our co-Trustees will require specially designed software and hardware, as well as information management architecture for tagging, cataloging, and creating document workflows for processing and reviewing documents. Staff and contractor time are required to design the architecture and process the documents in workflows that have been agreed to by all of the Trustees. These activities will occur continuously over the entire span of CY 2014;
(5) Additional web support to facilitate the public's ability to access the Administrative Record. This will include, but is not necessarily limited to, re-design of the website.

Deliverables Produced

DOI is responsible for three major activities to achieve these goals:

- Hiring contractor support to develop a technology system to facilitate the efficient collection, review and disposition of candidate records for inclusion in the NRDA AR;
- Initiating the collection, organization, routing, and management of AR records from technical teams, NRDA operational support groups, etc., that are candidates for inclusion in the NRDA AR; and
- Hiring contractor support to develop an AR-focused document repository for DOI and co-Trustees.

Relationship to Other Activities and Data

The AR is publicly accessible and is intended to provide the public with documents considered by the Trustees during the pre-assessment, assessment, and restoration planning phases of the NRDA performed in connection with the Oil Spill. DOI and NOAA are cooperating in developing the public-facing AR, but developing their respective portions independently. DOI is responsible, for example, for the AR for those resources for which they have primary responsibility including but not limited to Birds, Turtles, and Sturgeon. The other Trustees are primarily in an "as needed" role. Eventually, all AR documents will funnel into the DOI public-facing AR. In 2013, BP provided some funding for contractor support for this activity.

Principal Investigators

DOI staff efforts related to this activity are identified and described in this section, but the associated DOI personnel and travel costs are accounted for under Activity 14, DOI Injury Assessment, Restoration Planning, and Case Management. Senior DOI staff associated with this effort include Debora McClain, John Carlucci, Clare Cregan, Holly Deal, and Tony Irish. Other DOI staff associated with this effort include Amy Wisco, Denise Klimas, and Gina Ballard. Key contractor staff (IEc) associated with this effort include Daniel Hudgens, Neal Etre, and Ann Czerwonka.

RP Involvement

The Department has not coordinated with BP on the AR.

Timeframe

This activity will be ongoing throughout 2014.

8. 2014 IPC # 13: Restoration Planning

Purpose and Assessment Need

Early Restoration Planning

The Department continues to lead the coordination of Early Restoration for the Trustees to fulfill the "Framework for Early Restoration Addressing Injuries from the *Deepwater Horizon*

Oil Spill". This agreement requires that the Trustees work with BP to develop and assess a set of restoration projects intended to provide early restoration of injured natural resources and the services those resources provide. The benefits derived from the Early Restoration projects will be offset against BP's ultimate liability for restoration of trust resources injured by the spill. The Department is the chair of the *Deepwater Horizon* Trustee Council's Restoration Subcommittee. This subcommittee is comprised of Trustee representatives who have biological, ecological, legal and/or economic-based backgrounds. They work cooperatively on the development, selection and construction of offsets in relation to Early Restoration projects. Department staff work together with the other Trustees for both non-Department led and Department led projects and activities supporting OPA activities for developing restoration scaling and injury offsets. Department staff provides the leadership to bring projects up to both OPA and NEPA readiness through the signing of project-specific stipulations. The injury offsets must be incorporated into a draft restoration plan available for public review before both BP and the Trustees can stipulate to the offsets and proceed with project implementation. Therefore, restoration project scaling, alternatives analysis, and offset development were a time intensive effort for 2014.

In 2014, Phase III projects (44 projects at $627M) underwent public review and comment, and the Programmatic and Phase III Early Restoration Plan and Early Restoration Programmatic Environmental Impact Statement (Phase III ERP/PEIS) was finalized. The final Phase III ERP/PEIS document also includes the Programmatic Early Restoration Plan, which outlines how the Trustees are considering early restoration for the injured resources across the Gulf based on the Framework Agreement and OPA. The final Phase III ERP/PEIS was released to the public at the end of June. The Department is leading the development of the Record of Decision, with input from all the Trustees, which is expected to be signed before the end of the calendar year.

For Phase III projects, the Trustees worked towards completing environmental and regulatory compliance. The Department has taken the lead for the development and coordination of the Early Restoration planning efforts, appropriate NEPA, and environmental compliance consultations. Consultations on environmental compliance regulations and statutes are a specific part of the NEPA analysis. These compliance consultations include those required under provisions of, among other laws and regulations, the Endangered Species Act, the Coastal Zone Management Act, and Section 106 of the National Historic Preservation Act (NHPA). Department staff generated reviews, determinations and consultation letters for all 44 Phase III projects which encompass over 64 project footprints leading to more work than was first anticipated. Several of the 44 Phase III projects have multiple components to them in different geographic areas causing the need to conduct a separate consultation on each location. For the Endangered Species Act and Marine Mammal Protection Act the Department and NOAA have shared resources requiring close coordination between agencies for the consultations.

NHPA Section 106 requires consultations with States and various Tribal Nations that have interest in the Gulf of Mexico. To expedite the consultation process the Department concentrated on developing a Programmatic Agreement with the interested Tribes and the

State Historic Preservation Offices (SHPOs). The Tribes and SHPOs used the Spill response Section 106 process to review Early Restoration Phase I and II projects; this process was no longer working well for the consulting parties. The Section 106 process is, at its core, an evaluation of the impact of federal government activities on the cultural and historic landscape through data analysis and data collection. To begin the drafting of the NHPA Programmatic Agreement, a government to government meeting between the interested Tribal Nations and the United States was conducted. The Department spent the first part of 2014 working on collaborative language for the Section 106 Programmatic Agreement with the assistance from the NPS's Southeast Archaeological Center (SEAC), Tallahassee, FL. Staff from SEAC are familiar with programmatic agreements and have solid working relationships with the Tribes that have interest in the southeast.

A fourth phase of early restoration for the remaining ~$300M has been under development in 2014 as well. Phase IV projects are expected to require the same extensive level of planning, evaluation preparation, environmental compliance analysis, and public review as Phase III.

The Department requires technical support to continue its responsibilities under the Framework Agreement. Specifically, assistance is needed to identify the benefits of each restoration projects identified by Department staff, including appropriate metrics (biological, physical, human recreational use) that could be used to describe the benefits generated by each project, the time period over which those benefits will be generated, and the geographic scope of benefits, etc. These benefit measures will be used in negotiations with BP over the "offsets" (i.e., credits against natural resource damages) that will be provided by each project.

The Department also required technical support to organize and assist in writing the (Phase III ERP/PEIS). The documents were written by a committee of multiple members from each Council member. Assistance was needed to provide unbiased facilitation of the writing, leadership of side-groups to answer specific issues or questions that arose from the NEPA analysis and basic version control of a very large document. Identical assistance will be needed as the development of Phase IV continues.

Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement

Although NOAA is organizing the development of the *Deepwater Horizon* DARP and PEIS, DOI is assisting with leading several of the sub-teams in the development of restoration techniques, scaling of benefits and estimating costs for the implementation of the different types of restoration efforts which will be the basis of the Trustees claim of liability against the Responsible Party. The sub-teams being led by DOI include 1) restoration of avian injuries, 2) restoration of federal lands injured, 3) restoration of Federally-listed threatened and endangered species other than sea turtles that includes several species of beach mouse, Gulf sturgeon and potentially state-listed species such as the terrapin, and 4) the beaches and barrier islands sub-team that will include the restoration of response injury to those habitats. DOI personnel have specific expertise that is required on the NOAA-led restoration sub-teams. DOI has staff participating on the following sub-teams: 1) sea turtle restoration to

provide knowledge regarding sea turtle nesting, 2) marsh restoration, and 3) lost human use. Department staff also provide input from experts working on the *Deepwater Horizon* case, and they have the ability to bring forward from DOI bureaus extensive knowledge regarding management of marsh habitats and visitor services on DOI lands.

NOAA has organized the review and oversight of the DARP and Programmatic EIS using different layers of management. The Restoration Planning Team provides review and direction to the restoration sub-teams while the Trustee Management Team provides policy direction to the entire process. DOI has staff engaged at all levels in the development of the DARP and Programmatic EIS for the *Deepwater Horizon* case.

Relationship to Other Activities and Data

As part of its role in leading the early restoration activities, DOI is responsible for coordinating activities of the State and Federal Natural Resource Trustees (the Trustees). This includes organizing and facilitating monthly meetings of the Trustees, organizing phone meetings among trustee council groups and committees. DOI and its contractors provide technical and logistical support to the Trustee Council and Executive Council.

Deliverables Produced

Through 2013, the Trustees under DOI leadership had completed two phases of Early Restoration and had taken significant steps toward the development of a third phase that would include several more restoration projects across the Gulf, preparing a draft Phase III ERP/PEIS.. Contractor support was needed to manage the production of the draft and final Phase III ERP/PEIS documents. Similar contractor support is needed to manage development of early restoration plans and environmental reviews that will be a part of or tiered from the Phase III ERP/PEIS.

In 2014, DOI and its contractors completed the following to support completion of the Phase III ERP/PEIS and begin work on Phase IV and the development of the DARP:

- Conduct a public comment period pursuant to OPA (33 U.S.C. § 2706(c)(5)) and National Environmental Policy Act (NEPA; 40 C.F.R. § 1506.6) requirements to seek public review and comment on the Programmatic and Phase III Early Restoration Plan and PEIS. The Trustees conducted nine public meetings throughout the Gulf Region to seek public comment
- Collect, organize, and analyze all comments received (at the public meetings, by mail or email, or other mechanisms) into an online database
- Prepare responses to the comments received
- Prepare a final Phase III ERP/PEIS, incorporating responses to the comments received on the draft document
- Prepare a draft Record of Decision to document decisions made by the State and Federal Natural Resource Trustees for the Spill
- Incorporate comments from the Trustees and prepare a final ROD

- Assist in the development of new early restoration projects as Phase IV of the Early Restoration program
- Development of restoration technique screening tables for the DARP

Principal Investigators

DOI staff efforts related to this activity are identified and described in this section, but the associated DOI personnel and travel costs are accounted for under Activity 14, DOI Injury Assessment, Restoration Planning, and Case Management. The senior DOI staff involved in the restoration planning effort include Daniel Audet, James Haas, Amy Mathis, Jo Ellen Hinck, Alyssa Dausman, David Morgan, Colette Charbonneau, Kevin Reynolds, Brian Spears, Charles Wood, John Rudolph, and Holly Deal. Other DOI staff involved in the restoration planning effort are Amanda Demopoulos, Gregg Steyer, Satin Bowman, John Cornelison, Meredith Hardy, Tiffany Hensley, Andrew Mcfeaters, Kathryn Miyar, Timothy Roberts, Margo Schwadron, Michael Seibert, Rusty Simmons, Mark VanMouwerik, Holly Blalock-Herod, James Chapman, Benjamin Frater, Andrew Laughland, Ashley Mills, Christopher Pease, Robin Lynn Renn, and Jarrett Woodrow. Key contractor staff associated with the restoration planning effort include Andrew Schwarz, Michael Donlan, Meredith Amend, and Leslie Genova (all IEc); SWCA; and Louis-Berger.

Administrative Record

The DOI team will continue to respond to requests for documents to complete the administrative record. This activity will include providing new documents and data related to fieldwork and/or analyses. The costs of the DOI team in gathering and providing these records for Administrative Record purposes is captured here; the costs of capturing and processing these records for Administrative Record purposes is captured under the Administrative Record Tasks.

RP Involvement

In April 2011, the Trustees entered into an agreement under which BP agreed to provide up to $1 billion toward Early Restoration projects in the Gulf to address injuries to natural resources caused by the spill. This Early Restoration agreement, entitled "Framework for Early Restoration Addressing Injuries Resulting from the *Deepwater Horizon* Oil Spill" (Framework Agreement), is intended to facilitate and expedite restoration in the Gulf in advance of the completion of the NRDA process. The Framework Agreement provides a mechanism through which the Trustees and BP can work together "to commence implementation of Early Restoration projects that will provide meaningful benefits to accelerate restoration in the Gulf as quickly as practicable" prior to completion of the NRDA process or full resolution of the Trustees' natural resource damage claims.

BP is involved in the negotiations of the offsets and the budgets of the proposed projects for Early Restoration. The trustees are responsible for proposing and designing projects. BP can also, per the Framework Agreement, propose early restoration projects along the Gulf coast for the Trustees to take into consideration for negotiations. Once the Trustees identify projects and determine offsets and budgets, BP offers comments to the Early Restoration Plans and associated NEPA documentation through the public comment process. DOI

includes the response to these comments in the final document. DOI attorneys and DOI project staff coordinate stipulated agreement language with BP for the transfer of funds as well as offsets.

Timeframe

This activity will be ongoing throughout 2014.

9. 2014 IPC # 14: DOI Injury Assessment, Restoration Planning, and Case Management

This activity includes Incident-wide case management and administration costs for DOI. The DOI FTEs are program or regional managers that are dedicated for a significant period of time to the Oil Spill, or are staff assigned full-time to lead large areas of DOI's assessment activities at the technical and management level. Tasks include participation in Executive Council and Trustee Council subcommittees, budget and financial work, public affairs and communications, administrative support functions, contract management, and other overall case management. This activity also includes DOI's operational costs. Senior DOI staff involved in Case-wide management and administration efforts and not mentioned elsewhere in this Claim are Lynne Koontz, Bruce Peacock, Cynthia Dohner, Rachel Jacobson, Bob Dreher, Robin Heubel, and Faye Winters. Other DOI staff involved in Case-wide management and administration efforts and not mentioned elsewhere in this Claim are Lori Buitink, Dennis Hardy, Brenda Turrentine, Mary Heberts, Beth Wilson, Julia Towns, Susan Finger, Melissa Chavis, James Quade, Monica Vigil, Teresa Watson, Nancy Werdel, Albert Kagler, Cara Leigh Collins, Melba Davis, Steven Denbow, Helen Hammergren, Artela Jacobs, Nanciann Regalado, Pamela Rule, Vanessa Scott, Susan Vaughan, Teresa Ward, Deborah Warren, Charman Cupit, and Tyrone Santos. DOI attorneys involved in case management are John Carlucci, John Rudolph, Holly Deal, Amy Horner Hanley, Clare Cregan, Mary Lynn Taylor, Hilary Tompkins, Vanessa Ray-Hodges, and Mariagrazia Caminiti.

While DOI staff efforts related to particular injury assessment and response activities are identified and described in this Claim under the specific sections above, all Department personnel and travel costs associated with these efforts are accounted for under Activity #14. This activity also includes Department staff efforts which are not identified and described under specific sections above: Gulf Sturgeon, Beach Mouse, and Aerial Imagery.

Exhibit 4 provides a list of the DOI staff efforts in 2014, for which costs are all accounted for under Activity #14.

Exhibit 4: DOI Staff Efforts in 2014

DOI Staff Effort	***Specific or Case-Wide Effort?***	***Description of Effort in 2014 IPC Claim***
Birds Assessment (Avian Injury Quantification)	Specific	Described under Activity 3
Sea Turtle (Loggerhead and Kemp's Ridley) Assessment (Nesting and Hatchling Studies, Turtle Analytical Plan)	Specific	Described under Activities 1 and 2
Gulf Sturgeon	Specific	Described under Activity 14
Beach Mouse	Specific	Described under Activity 14
Sand Beach Response Injury	Specific	Described under Activity 7
Submerged Oil Mats	Specific	Described under Activities 6
Submerged Aquatic Vegetation (JELA, GUIS Prop Scars)	Specific	Described under Activities 4 and 5
Aerial Imagery	Specific	Described under Activity 14
Document Management (Case Record)	Case-Wide	Described under Activity 8
Trustee-Wide Administrative Record	Case-Wide	Described under Activity 12
Data Management (DOID)	Case-Wide	Described under Activities 10 and 11
Restoration Planning	Case-Wide	Described under Activity 13
DOI Lands (BLM, FWS, NPS)	Case-Wide	Described under Activities 4, 5, and 6
Participation in Executive Council and Trustee Council Subcommittees	Case-Wide	Described under Activity 14
Administrative Support Functions	Case-Wide	Described under Activity 14
Public Affairs and Communications	Case-Wide	Described under Activity 14
Budget and Financial Work	Case-Wide	Described under Activity 14
Case Management (Overall Oversight of Case)	Case-Wide	Described under Activity 14

The three specific DOI injury assessment and response efforts which are not identified and described in other sections of this Claim are Gulf Sturgeon, Beach Mouse, and Aerial Imagery. The descriptions below explain the purpose of each of these efforts, the tasks performed in 2014, the deliverables produced, and the principal staff involved.

Gulf Sturgeon:

Purpose and Injury Assessment Need

Direct contact of aquatic animals with waterborne contaminants and ingestion of contaminated sediment and prey items provides a pathway for potential exposure of fish to introduced xenobiotics associated with the MC 252 incident. In spring 2011, during their in-migration into rivers, sturgeon were captured and blood sampled as in fall 2010. The process of capturing and tagging fish, and monitoring the spatial and temporal patterns of fish movement in the field was repeated during fall 2011 through spring 2012 (i.e., Phase II). A parallel laboratory study involving controlled exposures of shovelnose sturgeon (a surrogate, and closely related species) to MC 252 oil was conducted to establish positive control samples that were examined in the same manner as samples obtained from Gulf sturgeon in the field. Patterns of Gulf residency, as revealed by telemetry, and the extent of oiling along Gulf shorelines provided the foundation for a coarse model of potential exposure that separated fish into East/Control and West (i.e., potentially exposed) regional groups.

In December 2013, DOI developed a partial draft report on potential exposure and injuries to threatened Gulf sturgeon due to MC 252 oil. This report presents information on wild Gulf sturgeon sampled in 2010-2012, and in particular describes the study's results on: telemetry, DNA damage, hematology, fish condition, and apparent survival. Ongoing work in 2014 includes measuring other endpoints in samples from these same wild fish (e.g. genomics), and also conducting toxicological laboratory studies on a surrogate species, the shovelnose sturgeon. DOI also continues to search for an expert who will review DOI's data along with other available information, with the goal of characterizing injury to Gulf sturgeon. The Department is requesting funding in 2014 for the salaries of DOI personnel involved in overseeing and coordinating efforts related to the completion of the Gulf sturgeon injury assessment.

Deliverables Produced

The Department's 2014 activities related to the endangered/threatened fish assessment are focusing on analysis of blood and water samples from laboratory tests and data management activities, such as additional quality assurance/quality control (QA/QC) activities, in coordination with co-Trustees and with BP, as appropriate. Additional effort is focused on the development, review (including peer review), and finalization of deliverables such as data reports and interpretive reports.

Relationship to Other Activities and Data

DOI is the only Trustee undertaking assessment activities for Gulf sturgeon. Data and analyses generated as part of these 2014 efforts, as well as other ongoing activities to document exposure and injury to fish, including NOAA's modeling efforts, need to be synthesized into an overall injury assessment.

Administrative Record

The DOI team will continue to respond to requests for documents to complete the administrative record. This activity will include providing new documents and data related to fieldwork and/or analyses. The costs of the DOI team in gathering and providing these records for Administrative Record purposes is captured here; the costs of capturing and processing these records for Administrative Record purposes is captured under the Administrative Record Tasks, Activity #12 in the Claim.

RP Involvement

Pre-assessment (Phase I) of Gulf Sturgeon injury was conducted as a cooperative work plan entitled "Mississippi Canyon 252 Pre-Assessment Plan for the Collection of Data to Determine Potential Exposure and Injuries of Threatened Gulf Sturgeon." The RP or their representatives were involved in all field work and received all data collected as outlined in the work plan. Assessment phase (Phase II) work was not conducted as a cooperative work plan and was done with very little involvement from the RP. The RP was involved in the initial development of the Phase II work plan, but no agreement was reached as to the content or need for conducting assessment work as listed in the work plan and the RP declined to participate. Interpretive summary of both phases are being conducted without input from the RP and will represent DOI's interpretation.

Principal Investigators

The DOI staff involved in overseeing and coordinating the Gulf sturgeon injury assessment are Donald Tillitt, Diane Nicks, David Alvarez, Robert Gale, Stephanie Perkins, Mike Tanner, Kevin Feltz, Jesse Arms, Jill Jenkins, Heather Birdsong, Glenn Constant, Adam Kaeser, Mike Randal, Susan Finger, Amy Horner Hanley, and Clare Cregan.

Beach Mouse:

Purpose and Injury Assessment Need

The large-scale beach access, clean-up, recovery, and contamination assessment efforts associated with the *Deepwater Horizon* Oil Spill caused direct and indirect impacts to the beach mice populations within the action area. The five Gulf Coast beach mice species are nocturnal and sensitive to anthropogenic activities. The coastal dune environments the beach mice inhabit are open habitats that have minimal buffering capacity. Thus, these habitats and occupants are susceptible to the negative effects of increased lighting, traffic, and other activities necessitated by clean-up and recovery actions. These species- and habitat-specific factors suggest that the staging, clean-up, and recovery activities caused both indirect and direct impacts to beach mice behavior and habitat.

The beach mouse study assessed the impacts of response related injuries through direct impacts to the vegetative component of the dune habitat and indirect impacts associated with increased clean-up and recovery activities within beach mouse habitat.

The access areas, where intensive operations occurred adjacent to dune habitats, were evaluated and mapped. The extent of primary injuries to dune habitat was evaluated through the interpretation of pre-Oil Spill aerial photographs and on-site habitat based assessments and mapping. Fifty six access points across seven counties in the Northern Gulf of Mexico were evaluated during this study which attempted to quantify the change in vegetative condition before and after intense oil clean up and recovery operations associated with the *Deepwater Horizon* spill. Seventeen of these sites exhibited a quantifiable loss of dune vegetation during and after the cleanup operations. Thirty percent of the areas we examined exhibited alterations in the form of a change in the vegetative signature, and vegetative structure following cleanup operations. Dune impacts at individual access points ranged from 21 ft^2 to 12,894 ft^2.Most impacts were located within Baldwin County, Alabama, where the beaches were most heavily oiled and subject to the most intense clean-up operations. Overall, the 56 areas surveyed exhibited dune impacts totaling 25,487 ft^2 (0.58 acre).

In addition to the direct physical impacts, increased human activity and introduction of heavy equipment would also have disruptive effects to the biotic and abiotic components of the dune ecosystem. Seven areas of intensive staging and recovery operations were identified and quantified as contributing indirect impacts to the biotic community, specifically the beach mice that inhabit these areas.

Deliverables Produced

In 2014, DOI is requesting funding for staff oversight and coordination of contractor efforts to write, revise, and finalize the assessment report on beach mouse habitat impacts resulting from the *Deepwater Horizon* spill cleanup efforts. A draft report was developed in March 2014.

Relationship to Other Activities and Data

The beach mouse injury assessment is being used to support overall injury assessment for the *Deepwater Horizon* Oil Spill.

Administrative Record

The DOI team will continue to respond to requests for documents to complete the administrative record. This activity will include providing new documents and data related to fieldwork and/or analyses. The costs of the DOI team in gathering and providing these records for Administrative Record purposes is captured here; the costs of capturing and processing these records for Administrative Record purposes is captured under the Administrative Record Tasks, Activity #12 in the Claim.

RP Involvement

Beach mouse habitat data collection efforts have been performed cooperatively in the field, and BP funded the field verification efforts. Aerial imagery used by the trustees was obtained and analyzed without support from the RP. Data and interpretative reporting are anticipated to be conducted independently of BP.

Principal Investigators

The DOI staff involved in overseeing and coordinating the beach mouse assessment are Benjamin Frater and Chip Wood.

Aerial Imagery:

Purpose and Injury Assessment Need

The Aerial Imagery (AI) technical team coordinates aerial and satellite imagery, remote sensing, and mapping to support and assist the various natural resource technical team and other activities in the ongoing *Deepwater Horizon* NRDA. Functions of the AI technical team include: determining and responding to the needs of the other technical teams, acquiring imagery identified by the Trustees to be useful for the NRDA, interpreting coastal habitats, coordinating geospatial capabilities and needs with the other technical teams, and making aerial imagery and mapping data available.

Since the Incident began, the Trustees have analyzed remote sensing data from several satellite-mounted sensors as well as high-resolution remote sensing data from airplane-mounted sensors to determine extent and thickness of oil on the ocean during the spill. The Trustees are utilizing Airborne Visible and InfraRed Imaging Spectrometer (AVIRIS) hyperspectral remote sensing data to assess the volume of surface oil related to the *Deepwater Horizon* incident on days when surface conditions (e.g., wind, waves, and sun angle) permit quantitative estimates. AVIRIS oil volume estimates derived from a spectral shape-matching system called Tetracorder can be used to extrapolate the density of oil on a per pixel basis to concurrent broad band visible satellite images that provide a more synoptic view of the Oil Spill. Values of the average oil volume/unit area for thick oil and sheens can be used to extrapolate to similar areas of thick oil and sheens not covered by AVIRIS on contemporaneous satellite/airborne images for selected days with the goal of providing synoptic quantitative oil volume inputs for ocean hydrodynamic models.

In 2014, activities conducted by DOI staff as part of the offshore oil volume AVIRIS assessment project include:

- Devising a method to weather Macondo crude oil in a laboratory setting using a fumehood and solar simulator. After 32 multiday weather attempts found that asphaltene content did not increase significantly but that evaporation reached as high as 60 % by weight. Investigators needed to increase asphaltene content to better match that of the natural emulsion samples collected back in summer of 2010. Asphaltene helps keep the water and oil emulsified.
- Designing and fabricating an outdoor weathering chamber to use sunlight and diurnal day/night cycles to weather crude oil to achieve a higher asphaltene content. Investigators did two 7-day and one 30-day weathering

runs with the crude on top of a layer of seawater to better simulate weathering in the natural environment.

- Experimenting with different homogenization methods and times to achieve a size distribution of water droplets that matched those of natural emulsion sample as determined by SEM comparisons.
- Preparing two sets of synthetic emulsions from weathered Macondo crude oil spanning the oil:water compositional space from 0 to 80 wt% water in 10 wt% increments.
- Devising a method of measuring the oil:water ratio of synthetic water-in-oil emulsions gravimetrically using demulsification by successive heating/centrifuging cycles. Investigators found a contract lab to conduct K-F volumetric titration measurements for water content of the synthetic emulsions. Investigators compared the two independent methods and determined the heat/centrifuging method was more accurate (good to ~ 2wt% H_2O). Both methods were used to verify water content of the synthetic emulsion sets.
- Quantifying the thickness of transmission cell spacers (20 to 1000 microns) using a thickness indicator, NIST traceable thin film plastic sheet standards, and a high accuracy digital torque wrench. Investigators fabricated Starfire glass mounted transmission cells for thickness from 2 to 30 mm.
- Setting up a 165 gallon sea simulator in our spectroscopy lab for spectral measurements of the natural and synthetic emulsions. Investigators determined that dispersed/centrifuged nano-sized aluminum oxide particles simulate the Rayleigh scattering in ocean water. Investigators devised a way to make spectral measurements of the samples in these transmission cells in direct contact with the simulated sea water to reduce refractive index effects of the air-glass interfaces. Reflectance measurements were made with and without scattered upwelling light.
- Measuring the reflectance and transmission spectra of 10 oil:water ratio combination emulsions at 11 thicknesses. Each emulsion set required 330 10-20 minute spectral measurements. Investigators converted transmission spectra to their absorption coefficient equivalent to provide inputs for radiative transfer modeling of emulsions and thin oil films.
- Making Corexit 9500 and synthetic emulsion mixtures to populate the Tetracorder library with spectra representative of areas of demulsified oil.
- Acquiring the ATCOR-4 radiative transfer software for calibration of AVIRIS data cubes to apparent reflectance. Investigators compared the output of this software with that produced using the ACORN software.

Investigators found both produce comparable calibrations of hyperspectral data.

- Upgrading to a new version of Tetracorder imaging spectroscopy analysis and mapping software. This program is the core system used to map oil. It has been upgraded with more capabilities to produce better maps, detecting more conditions and lower abundance of materials, including oil on the ocean's surface. The upgrade is complete and in testing.
- Upgrading radiative transfer modeling software (radtran): This modeling software is used to compute spectral response as a function of composition and scattering conditions. The software was upgraded to enable modeling of oil emulsions. The upgrade is complete and undergoing testing.
- Developing spectral viewing software (SPV): There is no commercial software that can rapidly display and overly image mapping products from imaging spectroscopy data that shows the intensity range of derived abundances overlaid on an image base and with the ability to extract spectroscopy data in complex patterns to evaluate mapping results. A new tool (SPV) has been written to enable this functionality. It is about 2/3 complete before it can be used in production.

Deliverables Produced

The estimation of offshore surface oil volume with AVIRIS will result in four major deliverables: 1) the selection and preparation of relevant AVIRIS data, 2) the synthesis of water-in-oil emulsions for spectral mapping, 3) the development of a radiative transfer model for mapping oil thickness, and 4) a Tetracorder mapping of AVIRIS data to derive oil volumes. Data collection and monitoring for this assessment are continuing in 2014; the Department is requesting funding to enable its staff to continue assisting with this effort under the leadership of its AVIRIS technical expert.

Relationship to Other Activities and Data

NOAA is leading the collection and analysis of remote sensing data to determine the extent and thickness of oil on the ocean surface as a result of the *Deepwater Horizon* spill. DOI is providing staff to assist with this effort under the leadership of its AVIRIS technical expert.

Administrative Record

The DOI team will continue to respond to requests for documents to complete the administrative record. This activity will include providing new documents and data related to fieldwork and/or analyses. The costs of the DOI team in gathering and providing these records for Administrative Record purposes is captured here; the costs of capturing and processing these records for Administrative Record purposes is captured under the Administrative Record Tasks, Activity #12 in the Claim.

RP Involvement

BP funded much of the aerial imagery work and was very involved in the early stages of the project through meetings and conference calls. Additionally, the development of the aerial imagery plan was a joint cooperative effort between the Trustee's and BP. However, the AVIRIS work plan was developed independently of BP.

Principal Investigators

The DOI staff involved in the aerial imagery effort are Gregg Swayze, Roger Clark, George Ingersoll, Larry Handley, Randall Dailey, Heather Lowers, Chad Alles, Robert Bracken, Jason Dugas, Irene Huber, Bill Jones, and Jeffrey Lucius.

Timeframe

This activity will be ongoing throughout 2014.